PATENT
(ATTORNEY DOCKET: 031855.0001C)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Richard William Falla LE PAGE et al.	)	Group Art Unit: To Be Assigned
	)	
Application Number: To Be Assigned	)	Examiner: To Be Assigned
	)	
Filed: January 26, 2001	)	
	)	
For: NUCLEIC ACIDS AND PROTEINS FROM STREPTOCOCCUS PNEUMONIAE		

SUBMISSION OF SEQUENCE LISTING

Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants submit herewith a paper copy of the Sequence Listing as filed in parent application number PCT/GB99/02452 filed July 27, 1999. The Sequence Listing in this application is identical to the Sequence Listing submitted in the parent application.

Applicants respectfully submit that it is unnecessary to file a computer readable form of the Sequence Listing, since it would be a duplicate of the computer readable form submitted in parent application number PCT/GB99/02452. Therefore, in accordance with 37 C.F.R. §1.821(e), no computer readable form is enclosed.

Applicants herewith request that the computer readable form submitted in parent application number PCT/GB99/02452 be used in this application. The undersigned certifies his belief that the computer readable form submitted in the parent application is identical in content to the paper copy of the Sequence Listing enclosed herewith.

It is believed that no fees are required for this submission; however, the Commissioner is authorized to charge any fee necessary for entry of this paper to Deposit Account 50-1640.

Respectfully submitted,

BROBECK, PHLEGER & HARRISON LLP

January 26, 2001

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SEQUENCE LISTING

<110> Microbial Technics Limited
Le Page, Richard WF
Wells, Jeremy M
Hanniffy, Sean B

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<150> GB 9816335.5
<151> 1998-07-27

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Lys Glu Leu Gly Tyr Thr Phe Asp Pro Phe Met Gly Asn Gly Gly Asp
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Arg Tyr Asp Asn Glu Glu Thr Leu Ala Asp Ile His Phe Thr Leu Glu
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Lys Gly Gln Thr Leu Gly Leu Val Gly Gln Thr Gly Ser Gly Lys Thr
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225                 230                 235                 240

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Thr Thr Val Val Lys Asn Ile Ile Pro Leu Ile Ala Ser His Phe Ile
         35                  40                  45

Asp His Tyr Leu Thr Asn Val Asn Gln Thr Ala Val Leu Ile Leu Val
     50                  55                  60

Gly Tyr Tyr Ser Met Tyr Val Leu Gln Thr Leu Ile Gln Tyr Phe Gly
 65                  70                  75                  80

Asn Leu Phe Phe Ala Arg Val Ser Tyr Ser Ile Val Arg Asp Ile Arg
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Ser Leu Leu Ser Asp Ile Asn Ser Lys Leu Ser Gly Ser Ile Glu Gly
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gcaaaaactt atctctttga ggatatagaa cctaattatt atcactttat gaatgaagat 2280
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<210> 10
<211> 1250
<212> PRT
<213> Streptococcus agalactiae

<400> 10

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Arg Lys Leu Ser Val Gly Val Ala Ser Val Ala Thr Gly Val Cys Ile
             20                  25                  30

Phe Leu His Ser Pro Gln Val Phe Ala Glu Glu Val Ser Val Ser Pro
         35                  40                  45

Ala Thr Thr Ala Ile Ala Lys Ser Asn Ile Asn Gln Val Asp Asn Arg
     50                  55                  60

Gln Ser Thr Asn Leu Lys Asp Asp Ile Asn Ser Asn Ser Glu Thr Val
 65                  70                  75                  80

Val Thr Pro Ser Asp Met Pro Asp Thr Lys Gln Leu Val Ser Asp Glu
                 85                  90                  95

Thr Asp Thr Gln Lys Gly Val Thr Glu Pro Asp Lys Ala Thr Ser Leu
            100                 105                 110

Leu Glu Glu Asn Lys Gly Pro Val Ser Asp Lys Asn Thr Leu Asp Leu
        115                 120                 125

Lys Val Ala Pro Ser Thr Leu Gln Asn Thr Pro Asp Lys Thr Ser Gln
    130                 135                 140

Ala Ile Gly Ala Pro Ser Pro Thr Leu Lys Val Ala Asn Gln Ala Pro
145                 150                 155                 160

Gln Ile Glu Asn Gly Tyr Phe Arg Leu His Leu Lys Glu Leu Pro Gln
                165                 170                 175
```

```
Gly His Pro Val Glu Ser Thr Gly Leu Trp Ile Trp Gly Asp Val Asp
            180                 185                 190

Gln Pro Ser Ser Asn Trp Pro Asn Gly Ala Ile Pro Met Thr Asn Ala
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Lys Lys Asp Asp Tyr Gly Tyr Tyr Val Asp Phe Lys Leu Ser Glu Lys
    210                 215                 220

Gln Arg Lys Gln Ile Ser Phe Leu Ile Asn Asn Lys Ala Gly Thr Asn
225                 230                 235                 240

Leu Ser Gly Asp His His Ile Pro Leu Leu Arg Pro Glu Met Asn Gln
                245                 250                 255

Val Trp Ile Asp Glu Lys Tyr Gly Ile His Thr Tyr Gln Pro Leu Lys
            260                 265                 270

Glu Gly Tyr Val Arg Ile Asn Tyr Leu Ser Ser Ser Gly Asn Tyr Asp
        275                 280                 285

His Leu Ser Ala Trp Leu Phe Lys Asp Val Ala Thr Pro Ser Thr Thr
    290                 295                 300

Trp Pro Asp Gly Ser Asn Phe Val Asn Gln Gly Leu Tyr Gly Arg Tyr
305                 310                 315                 320

Ile Asp Val Pro Leu Lys Thr Asn Ala Lys Glu Ile Gly Phe Leu Ile
                325                 330                 335

Leu Asp Glu Ser Lys Thr Gly Asp Ala Val Lys Val Gln Pro Asn Asp
            340                 345                 350

Tyr Val Phe Arg Asp Leu Ala Asn His Asn Gln Ile Phe Val Lys Asp
        355                 360                 365

Lys Asp Pro Lys Val Tyr Asn Asn Pro Tyr Tyr Ile Asp Gln Val Gln
    370                 375                 380
```

```
Leu Lys Asp Ala Gln Gln Thr Asp Leu Thr Ser Ile Gln Ala Ser Phe
385                 390                 395                 400

Thr Thr Leu Asp Gly Val Asp Lys Thr Glu Ile Leu Lys Glu Leu Lys
                405                 410                 415

Val Thr Asp Lys Asn Gln Asn Ala Ile Gln Ile Ser Asp Ile Thr Leu
            420                 425                 430

Asp Thr Ser Lys Ser Leu Leu Ile Ile Lys Gly Asp Phe Asn Pro Lys
        435                 440                 445

Gln Gly His Phe Asn Ile Ser Tyr Asn Gly Asn Asn Val Thr Thr Arg
    450                 455                 460

Gln Ser Trp Glu Phe Lys Asp Gln Leu Tyr Ala Tyr Ser Gly Asn Leu
465                 470                 475                 480

Gly Ala Val Leu Asn Gln Asp Gly Ser Lys Val Glu Ala Ser Leu Trp
                485                 490                 495

Ser Pro Ser Ala Asp Ser Val Thr Met Ile Ile Tyr Asp Lys Asp Asn
            500                 505                 510

Gln Asn Arg Val Val Ala Thr Thr Pro Leu Val Lys Asn Asn Lys Gly
        515                 520                 525

Val Trp Gln Thr Ile Leu Asp Thr Lys Leu Gly Ile Lys Asn Tyr Thr
    530                 535                 540

Gly Tyr Tyr Tyr Leu Tyr Glu Ile Lys Arg Gly Lys Asp Lys Val Lys
545                 550                 555                 560

Ile Leu Asp Pro Tyr Ala Lys Ser Leu Ala Glu Trp Asp Ser Asn Thr
                565                 570                 575

Val Asn Asp Asp Ile Lys Thr Ala Lys Ala Ala Phe Val Asn Pro Ser
            580                 585                 590
```

```
Gln Leu Gly Pro Lys Asn Leu Ser Phe Ala Lys Ile Ala Asn Phe Lys
        595                 600                 605

Gly Lys Gln Asp Ala Val Ile Tyr Glu Ala His Val Arg Asp Phe Thr
    610                 615                 620

Ser Asp Gln Ser Leu Asp Gly Lys Leu Lys Asn Gln Leu Gly Thr Phe
625                 630                 635                 640

Ala Ala Phe Ser Glu Lys Leu Asp Tyr Leu Gln Lys Leu Gly Val Thr
                645                 650                 655

His Ile Gln Leu Leu Pro Val Leu Ser Tyr Phe Tyr Val Asn Glu Met
            660                 665                 670

Asp Lys Ser Arg Ser Thr Ala Tyr Thr Ser Ser Asp Asn Asn Tyr Asn
        675                 680                 685

Trp Gly Tyr Asp Pro Gln Ser Tyr Phe Ala Leu Ser Gly Met Tyr Ser
    690                 695                 700

Glu Lys Pro Lys Asp Pro Ser Ala Arg Ile Ala Glu Leu Lys Gln Leu
705                 710                 715                 720

Ile His Asp Ile His Lys Arg Gly Met Gly Val Ile Leu Asp Val Val
                725                 730                 735

Tyr Asn His Thr Ala Lys Thr Tyr Leu Phe Glu Asp Ile Glu Pro Asn
            740                 745                 750

Tyr Tyr His Phe Met Asn Glu Asp Gly Ser Pro Arg Glu Ser Phe Gly
        755                 760                 765

Gly Gly Arg Leu Gly Thr Thr His Ala Met Ser Arg Arg Val Leu Val
    770                 775                 780

Asp Ser Ile Lys Tyr Leu Thr Ser Glu Phe Lys Val Asp Gly Phe Arg
785                 790                 795                 800
```

```
Phe Asp Met Met Gly Asp His Asp Ala Ala Ala Ile Glu Leu Ala Tyr
                805                 810                 815

Lys Glu Ala Lys Ala Ile Asn Pro Asn Met Ile Met Ile Gly Glu Gly
            820                 825                 830

Trp Arg Thr Phe Gln Gly Asp Gln Gly Lys Pro Val Lys Pro Ala Asp
        835                 840                 845

Gln Asp Trp Met Lys Ser Thr Asp Thr Val Gly Val Phe Ser Asp Asp
    850                 855                 860

Ile Arg Asn Ser Leu Lys Ser Gly Phe Pro Asn Glu Gly Thr Pro Ala
865                 870                 875                 880

Phe Ile Thr Gly Gly Pro Gln Ser Leu Gln Gly Ile Phe Lys Asn Ile
                885                 890                 895

Lys Ala Gln Pro Gly Asn Phe Glu Ala Asp Ser Pro Gly Asp Val Val
            900                 905                 910

Gln Tyr Ile Ala Ala His Asp Asn Leu Thr Leu His Asp Val Ile Ala
        915                 920                 925

Lys Ser Ile Asn Lys Asp Pro Lys Val Ala Glu Glu Asp Ile His Arg
    930                 935                 940

Arg Leu Arg Leu Gly Asn Val Met Ile Leu Thr Ser Gln Gly Thr Ala
945                 950                 955                 960

Phe Ile His Ser Gly Gln Glu Tyr Gly Arg Thr Lys Arg Leu Leu Asn
                965                 970                 975

Pro Asp Tyr Met Thr Lys Val Ser Asp Asp Lys Leu Pro Asn Lys Ala
            980                 985                 990

Thr Leu Ile Glu Ala Val Lys Glu Tyr Pro Tyr Phe Ile His Asp Ser
        995                1000                1005
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Tyr Asp Ser Ser Asp Ala Ile Asn His Phe Asp Trp Ala Ala Ala Thr
1010 1015 1020

Asp Asn Asn Lys His Pro Ile Ser Thr Lys Thr Gln Ala Tyr Thr Ala
1025 1030 1035 1040

Gly Leu Ile Thr Leu Arg Arg Ser Thr Asp Ala Phe Arg Lys Leu Ser
1045 1050 1055

Lys Ala Glu Ile Asp Arg Glu Val Ser Leu Ile Thr Glu Val Gly Gln
1060 1065 1070

Gly Asp Ile Lys Glu Lys Asp Leu Val Ile Ala Tyr Gln Thr Ile Asp
1075 1080 1085

Ser Lys Gly Asp Ile Tyr Ala Val Phe Val Asn Ala Asp Ser Lys Ala
1090 1095 1100

Arg Asn Val Leu Leu Gly Glu Lys Tyr Lys His Leu Leu Lys Gly Gln
1105 1110 1115 1120

Val Ile Val Asp Ala Asp Gln Ala Gly Ile Lys Pro Ile Ser Thr Pro
1125 1130 1135

Arg Gly Val His Phe Glu Lys Asp Ser Leu Leu Ile Asp Pro Leu Thr
1140 1145 1150

Ala Ile Val Ile Lys Val Gly Lys Val Ala Pro Ser Pro Lys Glu Glu
1155 1160 1165

Leu Gln Ala Asp Tyr Pro Lys Thr Gln Ser Phe Lys Gly Ser Lys Thr
1170 1175 1180

Val Glu Lys Val Asn Arg Ile Ala Asn Lys Thr Ser Ile Thr Pro Val
1185 1190 1195 1200

Val Ser Asn Lys Thr Asp Ser Tyr Leu Thr Asn Glu Ala Asn Leu Pro
1205 1210 1215

Lys Thr Gly Asp Lys Ser Ser Lys Ile Leu Ser Val Val Gly Ile Ser
1220 1225 1230

Ile Leu Ala Ser Leu Leu Ala Leu Leu Gly Leu Ser Leu Lys Arg Asn
1235 1240 1245

Arg Thr
1250

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<211> 921
<212> DNA
<213> Streptococcus agalactiae

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ccaatgtatg cgatgacaaa agaagtatct ggagacctaa atgatgtgag gatgatccaa 180
tcaggtgcag gcattcattc ctttgaaccg tctgtaaatg atgtggcagc tatttatgac 240
gcggatttgt ttgtttacca atcacatacc ttagaagctt gggcaaggga tctagaccct 300
aatttaaaaa aatcaaaggt taatgtgttt gaagcgtcaa aacctctgac actagataga 360
gtcaaagggc tagaagatat ggaagtcaca caaggcattg accctgcgac actttatgac 420
ccacatacct ggacggatcc cgttttagct ggtgaggaag ctgttaatat cgctaaagag 480
ctaggacatt tggatcctaa acacaaagac agttacacta aaaaggctaa ggctttcaaa 540
aaagaagcag agcaactaac tgaagaatac actcaaaaat ttaaaaaggt gcgctcaaaa 600
acatttgtga cgcaacacac ggcattttct tatctggcta aacgattcgg cttgaaacaa 660
cttggtatct cgggtatttc tccagagcaa gagccctctc ctcgccaatt gaaagaaatt 720
caagactttg ttaaagaata caacgtcaag actatttttg cagaagacaa cgtcaacccc 780
aaaattgctc atgctattgc gaaatcaaca ggagctaaag taaagacatt aagtccactt 840
gaagctgctc caagcggaaa caagacatat ctagaaaatc ttagagcaaa tttggaagtg 900
ctctatcaac agttgaagta a 921

<210> 12
<211> 306
<212> PRT
<213> Streptococcus agalactiae

<400> 12

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Met Lys Lys Val Phe Phe Leu Met Ala Met Val Val Ser Leu Val Met
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Ile Ala Gly Cys Asp Lys Ser Ala Asn Pro Lys Gln Pro Thr Gln Gly
             20                  25                  30

Met Ser Val Val Thr Ser Phe Tyr Pro Met Tyr Ala Met Thr Lys Glu
         35                  40                  45

Val Ser Gly Asp Leu Asn Asp Val Arg Met Ile Gln Ser Gly Ala Gly
     50                  55                  60

Ile His Ser Phe Glu Pro Ser Val Asn Asp Val Ala Ala Ile Tyr Asp
 65                  70                  75                  80

Ala Asp Leu Phe Val Tyr Gln Ser His Thr Leu Glu Ala Trp Ala Arg
                 85                  90                  95

Asp Leu Asp Pro Asn Leu Lys Lys Ser Lys Val Asn Val Phe Glu Ala
            100                 105                 110

Ser Lys Pro Leu Thr Leu Asp Arg Val Lys Gly Leu Glu Asp Met Glu
        115                 120                 125

Val Thr Gln Gly Ile Asp Pro Ala Thr Leu Tyr Asp Pro His Thr Trp
    130                 135                 140

Thr Asp Pro Val Leu Ala Gly Glu Glu Ala Val Asn Ile Ala Lys Glu
145                 150                 155                 160

Leu Gly His Leu Asp Pro Lys His Lys Asp Ser Tyr Thr Lys Lys Ala
                165                 170                 175
```

Lys Ala Phe Lys Lys Glu Ala Glu Gln Leu Thr Glu Glu Tyr Thr Gln
180 185 190

Lys Phe Lys Lys Val Arg Ser Lys Thr Phe Val Thr Gln His Thr Ala
195 200 205

Phe Ser Tyr Leu Ala Lys Arg Phe Gly Leu Lys Gln Leu Gly Ile Ser
210 215 220

Gly Ile Ser Pro Glu Gln Glu Pro Ser Pro Arg Gln Leu Lys Glu Ile
225 230 235 240

Gln Asp Phe Val Lys Glu Tyr Asn Val Lys Thr Ile Phe Ala Glu Asp
245 250 255

Asn Val Asn Pro Lys Ile Ala His Ala Ile Ala Lys Ser Thr Gly Ala
260 265 270

Lys Val Lys Thr Leu Ser Pro Leu Glu Ala Ala Pro Ser Gly Asn Lys
275 280 285

Thr Tyr Leu Glu Asn Leu Arg Ala Asn Leu Glu Val Leu Tyr Gln Gln
290 295 300

Leu Lys
305

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<212> DNA
<213> Streptococcus agalactiae

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aatcaaagtc aaggtaatgt tttagagcgt cgccaacgtg atgcggaaaa caaaagtcag 180

ggtaatgttt tagagcgtcg ccaacgtgat gcggaaaaca agagccaagg caatgtttta 240
gagcgtcgtc aacgcgatgt tgagaataag agccaaggca atgttttaga gcgtcgtcaa 300
cgtgatgcgg aaaacaaaag tcagggcaat gttctagagc gccgccaacg tgatgcggat 360
aacaagagcc aagtaggtca acttataggg aaaaatccac ttttttcaaa gccaactgta 420
tctagagaaa ataatcactc tagtcaaggt gactctaaca aacagtcatt ctctaaaaaa 480
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<210> 14
<211> 218
<212> PRT
<213> Streptococcus agalactiae

<400> 14

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Met Phe Asn Lys Ile Gly Phe Arg Thr Trp Lys Ser Gly Lys Leu Trp
  1               5                  10                  15

Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro
             20                  25                  30

Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu
         35                  40                  45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
     50                  55                  60

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
 65                  70                  75                  80

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu
                 85                  90                  95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu
            100                 105                 110
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Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Val Gly Gln Leu
115 120 125

Ile Gly Lys Asn Pro Leu Phe Ser Lys Pro Thr Val Ser Arg Glu Asn
130 135 140

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys
145 150 155 160

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn
165 170 175

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Gly Asp
180 185 190

Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr
195 200 205

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn
210 215

<210> 15
<211> 1029
<212> DNA
<213> Streptococcus agalactiae

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attaaaaaag aaaaaagaga caagccggat aataaaaagc aaatcagcga gacacttaaa 180
gttcctttaa aacccaaaaa agtagttgtt tttgatatgg gagctttgga tactatcaca 240
gctttaggag ctgaaaaatc tgttattggt atcccgaagg ctaaaaatgc tctaagttta 300
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gtaatggcaa acagcggtga acttttaact caatcacctt ctggtcgttt tggttggatt 720
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<210> 16
<211> 342
<212> PRT
<213> Streptococcus agalactiae

<400> 16
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Thr Thr Ser Gln Ala Val Leu Ala Lys Glu Lys Ser Gln Thr Val Thr
20 25 30

Ile Lys Asn Asn Tyr Ser Val Tyr Ile Lys Lys Glu Lys Arg Asp Lys
35 40 45

Pro Asp Asn Lys Lys Gln Ile Ser Glu Thr Leu Lys Val Pro Leu Lys
50 55 60

Pro Lys Lys Val Val Val Phe Asp Met Gly Ala Leu Asp Thr Ile Thr
65 70 75 80

Ala Leu Gly Ala Glu Lys Ser Val Ile Gly Ile Pro Lys Ala Lys Asn
85 90 95

Ala Leu Ser Leu Leu Pro Asn Asn Val Lys Ser Val Tyr Lys Ala Lys
100 105 110

Arg Tyr Gln Asp Val Gly Ser Leu Phe Glu Pro Asn Phe Glu Ala Ile
115 120 125

Ala Arg Met Gln Pro Asp Val Val Phe Leu Gly Ala Arg Met Ala Ser
130 135 140

Val Asp Asn Ile Glu Lys Leu Lys Glu Ala Ala Pro Lys Ala Ala Leu
145 150 155 160

Val Tyr Ala Gly Val Asp Ser Lys Lys Val Phe Asp Lys Gly Val Ala
165 170 175

Glu Arg Val Thr Met Leu Gly Lys Ile Phe Asp Gln Asn Lys Lys Ala
180 185 190

Lys Thr Phe Asn Lys Asp Ile Ala Gln Ala Val Leu Lys Leu Gln Lys
195 200 205

Thr Ile Glu Lys Lys Gly Lys Pro Thr Ala Leu Phe Val Met Ala Asn
210 215 220

Ser Gly Glu Leu Leu Thr Gln Ser Pro Ser Gly Arg Phe Gly Trp Ile
225 230 235 240

Phe Ser Val Gly Gly Phe Lys Ala Val Asn Glu Asn Glu Lys Leu Ser
245 250 255

Ser His Gly Thr Pro Val Ser Tyr Glu Tyr Ile Ala Glu Lys Asn Pro
260 265 270

Asn Tyr Leu Phe Val Leu Asp Arg Gly Ala Thr Ile Gly Gln Gly Ala
275 280 285

Ser Ser Lys Glu Leu Phe Asn Asn Asp Val Ile Lys Ala Thr Asp Ala
290 295 300

Val Lys Asn Lys Arg Val His Glu Val Asp Gly Lys Asp Trp Tyr Ile
305 310 315 320

Asn Ser Gly Gly Ser Arg Val Thr Leu Arg Met Ile Lys Asp Val Gln
325 330 335

Asn Phe Val Asp Asn Arg
340

<210> 17
<211> 2469
<212> DNA
<213> Streptococcus agalactiae

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tatattgatg atagcaaagg taaggtaaaa gcccctaaaa caaacaaaac gatggatcaa 180
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ggtcgttttg cagcaccaga cggctatatt ttcgatccac gagatgtttt ggcaaaagaa 2040
acttttgtat ggaaagatgg ctcctttagc atcccaagag cagatggcag ttcattgaga 2100
accattaata aatccgatct atcccaagct gagtggcaac aagctcaaga gttattggca 2160
aagaaaaatg ctggtgatgc tactgatacg gataaacctg aagaaaagca acaggcagat 2220
aagagcaatg aaaaccaaca gccaagtgaa gccagtaaag aagaaaaaga atcagatgac 2280
tttatagaca gtttaccaga ctatggtcta gatagagcaa ccctagaaga tcatatcaat 2340
caattagcac aaaaagctaa tatcgatcct aagtatctca ttttccaacc agaaggtgtc 2400
caattttata ataaaaatgg tgaattggta acttatgata tcaagacact tcaacaaata 2460
aaccettaa 2469

<210> 18
<211> 822
<212> PRT
<213> Streptococcus agalactiae

<400> 18
Met Lys Lys Thr Tyr Gly Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu
1 5 10 15

Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu
20 25 30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys
35 40 45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
50 55 60

```
Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
 65                  70                  75                  80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
                85                  90                  95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
            100                 105                 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr
        115                 120                 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser
    130                 135                 140

Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala
145                 150                 155                 160

Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His
                165                 170                 175

Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly
            180                 185                 190

Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile
        195                 200                 205

Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His
    210                 215                 220

Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln
225                 230                 235                 240

Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr
                245                 250                 255

Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro Asp Val
            260                 265                 270
```

Thr Pro Asn Pro Gly Gln Gly His Gln Pro Asp Asn Gly Gly Tyr His
275 280 285

Pro Ala Pro Pro Arg Pro Asn Asp Ala Ser Gln Asn Lys His Gln Arg
290 295 300

Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp His Leu His
305 310 315 320

Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe
325 330 335

Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro
340 345 350

His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu
355 360 365

Glu Met Glu Leu Ala Asp Arg Tyr Leu Ala Gly Gln Thr Asp Asp Asn
370 375 380

Asp Ser Gly Ser Asp His Ser Lys Pro Ser Asp Lys Glu Val Thr His
385 390 395 400

Thr Phe Leu Gly His Arg Ile Lys Ala Tyr Gly Lys Gly Leu Asp Gly
405 410 415

Lys Pro Tyr Asp Thr Ser Asp Ala Tyr Val Phe Ser Lys Glu Ser Ile
420 425 430

His Ser Val Asp Lys Ser Gly Val Thr Ala Lys His Gly Asp His Phe
435 440 445

His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val
450 455 460

Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala
465 470 475 480

```
Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys
                485                 490                 495

Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro
            500                 505                 510

Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr
        515                 520                 525

Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His
    530                 535                 540

Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val
545                 550                 555                 560

Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr
                565                 570                 575

Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro
            580                 585                 590

Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met
        595                 600                 605

Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu
    610                 615                 620

Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala
625                 630                 635                 640

Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys
                645                 650                 655

Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp
            660                 665                 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser
        675                 680                 685
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Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys
690 695 700

Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala
705 710 715 720

Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys
725 730 735

Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser
740 745 750

Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr
755 760 765

Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln
770 775 780

Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val
785 790 795 800

Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr
805 810 815

Leu Gln Gln Ile Asn Pro
820

<210> 19
<211> 939
<212> DNA
<213> Streptococcus agalactiae

<400> 19
atgatacgcc agtttttaag agaacacttg atttggtata ttttatatat catgatgttt 60
gtcctatttt ttattagttt ctatctatat catttaccaa tgccctattt gtttaattcc 120
ttaggtttaa atgttattgt tttactagga attagtattt ggcaatacag tcgttacagg 180

aaaaaaatgt tacatctcaa atattttaat agtagtcagg acccctcttt cgaacttcaa 240
ccgagtgatt acgcttattt taatattatt acacaattag aagctagaga agcgcaaaaa 300
gtttctgaaa caattgaaca aaccaatcat gttgcactta tgataaagat gtggtcgcac 360
caaatgaaag ttccattggc agctatttca ttaatggccc agacaaatca tctcgatcct 420
aaggaagttg aacaacaatt attgaaattg caacattatc ttgaaacgtt gttagcattt 480
ttgaaattta gacaatatcg tgacgatttt cgttttgaag ctgttagcct tagagaagta 540
gtagtagaaa ttataaaatc gtataaggtt atttgtctat ccaaaagctt atctatcata 600
attgaaggcg ataatatctg gaaaacagac aaaaagtggt taacttttgc tctttcacag 660
gtgctagata atgccataaa atattctaat cctgagtcaa agataataat aagcatagga 720
gaagagagta ttagaataca agactacggt atcggcatac tcgaagagga tatccctaga 780
ctttttgaag atggctttac gggttacaac ggtcatgagc accaaaaggc aacaggcatg 840
gggttatata tgacaaaaga agtcttatct agtctgaatt tgtccatttc ggtggatagc 900
aaaattaatt atgggactgc tgtttctata cataaataa 939

<210> 20
<211> 312
<212> PRT
<213> Streptococcus agalactiae

<400> 20
Met Ile Arg Gln Phe Leu Arg Glu His Leu Ile Trp Tyr Ile Leu Tyr
1 5 10 15

Ile Met Met Phe Val Leu Phe Phe Ile Ser Phe Tyr Leu Tyr His Leu
20 25 30

Pro Met Pro Tyr Leu Phe Asn Ser Leu Gly Leu Asn Val Ile Val Leu
35 40 45

Leu Gly Ile Ser Ile Trp Gln Tyr Ser Arg Tyr Arg Lys Lys Met Leu
50 55 60

His Leu Lys Tyr Phe Asn Ser Ser Gln Asp Pro Ser Phe Glu Leu Gln
65 70 75 80

Pro Ser Asp Tyr Ala Tyr Phe Asn Ile Ile Thr Gln Leu Glu Ala Arg
85 90 95

```
Glu Ala Gln Lys Val Ser Glu Thr Ile Glu Gln Thr Asn His Val Ala
            100                 105                 110

Leu Met Ile Lys Met Trp Ser His Gln Met Lys Val Pro Leu Ala Ala
        115                 120                 125

Ile Ser Leu Met Ala Gln Thr Asn His Leu Asp Pro Lys Glu Val Glu
    130                 135                 140

Gln Gln Leu Leu Lys Leu Gln His Tyr Leu Glu Thr Leu Leu Ala Phe
145                 150                 155                 160

Leu Lys Phe Arg Gln Tyr Arg Asp Asp Phe Arg Phe Glu Ala Val Ser
                165                 170                 175

Leu Arg Glu Val Val Val Glu Ile Ile Lys Ser Tyr Lys Val Ile Cys
            180                 185                 190

Leu Ser Lys Ser Leu Ser Ile Ile Ile Glu Gly Asp Asn Ile Trp Lys
        195                 200                 205

Thr Asp Lys Lys Trp Leu Thr Phe Ala Leu Ser Gln Val Leu Asp Asn
    210                 215                 220

Ala Ile Lys Tyr Ser Asn Pro Glu Ser Lys Ile Ile Ile Ser Ile Gly
225                 230                 235                 240

Glu Glu Ser Ile Arg Ile Gln Asp Tyr Gly Ile Gly Ile Leu Glu Glu
                245                 250                 255

Asp Ile Pro Arg Leu Phe Glu Asp Gly Phe Thr Gly Tyr Asn Gly His
            260                 265                 270

Glu His Gln Lys Ala Thr Gly Met Gly Leu Tyr Met Thr Lys Glu Val
        275                 280                 285

Leu Ser Ser Leu Asn Leu Ser Ile Ser Val Asp Ser Lys Ile Asn Tyr
    290                 295                 300
```

Gly Thr Ala Val Ser Ile His Lys
305 310

<210> 21
<211> 942
<212> DNA
<213> Streptococcus agalactiae

<400> 21
atgacttatc aaaaaacagt tgttttggct ggtgattatt cctacattag acaaattgaa 60
accacattaa aatctctctg tgtctatcat gagaatctct caatttttat ttttaatcaa 120
gatattcctc aagaatggtt tttagctatg aaagataggg ttggacaaac tggaaatcaa 180
attcaggatg taaagctctt ccatgatcac ttatccccaa aatgggaaaa taaaaagctt 240
aatcatatta attatatgac ctatgctcgt tatttcatac ctcagtacat ctcagctgat 300
acagttttat atcttgactc tgacttagtt gttactacta atttagataa cctctttcaa 360
atttcactag acaatgcata tttagctgca gttccagctc tttttgggct tggatatggg 420
tttaatgctg gagtaatggt aattaacaac caacgttggc gacaagaaaa tatgactatt 480
aaattaattg aaaaaaatca aaaggaaatt gagaatgcca acgaagggga tcaaacaatt 540
cttaatcgca tgtttgaaaa tcaggtaatt tatttagatg atacctacaa ttttcaaatt 600
ggttttgata tgggagctgc tatcgatggg cataaattta tttttgacat cccaattacc 660
ccactcccaa aaattattca ctacatttcg ggaatcaaac cttggcaaac attatcaaat 720
atgagactcc gtgaggtatg gtggcactat aatttacttg aatggtcaag tatcatatct 780
agtaaaaaag tatttggttt agaccaccca attaaaacac aaaattatcg tctcaatttc 840
cttattgcta caacttctga ttgtatacca tctatctcag aattagtcac tgcccttcca 900
gattgtctat ttcacattgc atgcaccaac agttatgtct ga 942

<210> 22
<211> 313
<212> PRT
<213> Streptococcus agalactiae

<400> 22
Met Thr Tyr Gln Lys Thr Val Val Leu Ala Gly Asp Tyr Ser Tyr Ile
1 5 10 15

```
Arg Gln Ile Glu Thr Thr Leu Lys Ser Leu Cys Val Tyr His Glu Asn
            20                  25                  30

Leu Ser Ile Phe Ile Phe Asn Gln Asp Ile Pro Gln Glu Trp Phe Leu
        35                  40                  45

Ala Met Lys Asp Arg Val Gly Gln Thr Gly Asn Gln Ile Gln Asp Val
    50                  55                  60

Lys Leu Phe His Asp His Leu Ser Pro Lys Trp Glu Asn Lys Lys Leu
65                  70                  75                  80

Asn His Ile Asn Tyr Met Thr Tyr Ala Arg Tyr Phe Ile Pro Gln Tyr
                85                  90                  95

Ile Ser Ala Asp Thr Val Leu Tyr Leu Asp Ser Asp Leu Val Val Thr
            100                 105                 110

Thr Asn Leu Asp Asn Leu Phe Gln Ile Ser Leu Asp Asn Ala Tyr Leu
        115                 120                 125

Ala Ala Val Pro Ala Leu Phe Gly Leu Gly Tyr Gly Phe Asn Ala Gly
    130                 135                 140

Val Met Val Ile Asn Asn Gln Arg Trp Arg Gln Glu Asn Met Thr Ile
145                 150                 155                 160

Lys Leu Ile Glu Lys Asn Gln Lys Glu Ile Glu Asn Ala Asn Glu Gly
                165                 170                 175

Asp Gln Thr Ile Leu Asn Arg Met Phe Glu Asn Gln Val Ile Tyr Leu
            180                 185                 190

Asp Asp Thr Tyr Asn Phe Gln Ile Gly Phe Asp Met Gly Ala Ala Ile
        195                 200                 205

Asp Gly His Lys Phe Ile Phe Asp Ile Pro Ile Thr Pro Leu Pro Lys
    210                 215                 220
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Ile Ile His Tyr Ile Ser Gly Ile Lys Pro Trp Gln Thr Leu Ser Asn
225 230 235 240

Met Arg Leu Arg Glu Val Trp Trp His Tyr Asn Leu Leu Glu Trp Ser
245 250 255

Ser Ile Ile Ser Ser Lys Lys Val Phe Gly Leu Asp His Pro Ile Lys
260 265 270

Thr Gln Asn Tyr Arg Leu Asn Phe Leu Ile Ala Thr Thr Ser Asp Cys
275 280 285

Ile Pro Ser Ile Ser Glu Leu Val Thr Ala Leu Pro Asp Cys Leu Phe
290 295 300

His Ile Ala Cys Thr Asn Ser Tyr Val
305 310

<210> 23
<211> 1146
<212> DNA
<213> Streptococcus agalactiae

<400> 23
gtgaagaaaa catattgtta tatcggctca gttgctgcta ttttactagc tactcatatt 60
ggaagttacc agcttggtaa gcatcatatg ggtctagcaa caaaggacaa tcagattgcc 120
tatattgatg atagcaaagg taaggtaaaa gcccctaaaa caaacaaaac cgatggatcaa 180
atcagtgctg aagaaggcat ctctgctgaa cagatcgtag tcaaaattac tgaccaaggt 240
tatgttacct cacacggtga ccattatcat ttttacaatg ggaaagttcc ttatgatgcg 300
attattagtg aagagttgtt gatgacggat cctaattacc attttaaaca atcagacgtt 360
atcaatgaaa tcttagacgg ttacgttatt aaagtcaatg gcaactatta tgtttacctc 420
aagccaggta gtaagcgcaa aaacattcga accaaacaac aaattgctga gcaagtagcc 480
aaaggaacta aagaagctaa agaaaaaggt ttagctcaag tggcccatct cagtaaagaa 540
gaagttgcgg cagtcaatga agcaaaaaga caaggacgct atactacaga cgatggctat 600
atttttagtc cgacagatat cattgatgat ttaggagatg cttatttagt acctcatggt 660
aatcactatc attatattcc taaaaaagat ttgtctccaa gtgagctagc tgctgcacaa 720

gcctactgga gtcaaaaaca aggtcgaggt gctagaccgt ctgattaccg cccgacacca 780
gccccaggtc gtaggaaagc cccacttcct gatgtgacgc ctaaccctgg acaaggtcat 840
cagccagata acggtggtta tcatccagcg cctcctaggc caaatgatgc gtcacaaaac 900
aaacaccaaa gagatgagtt taaaggaaaa acctttaagg aacttttaga tcaactacac 960
cgtcttgatt tgaaataccg tcatgtggaa gaagatgggt tgatttttga accgactcaa 1020
gtgatcaaat caaacgcttt tgggtatgtg gtgcctcatg gagatcatta tcatattatc 1080
ccaagaagtc agttatcacc tcttgaaatg gaattagcag atcgatactt aacccggcca 1140
aactga 1146

<210> 24
<211> 381
<212> PRT
<213> Streptococcus agalactiae

<400> 24
Met Lys Lys Thr Tyr Cys Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu
1 5 10 15

Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu
20 25 30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys
35 40 45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
50 55 60

Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly
65 70 75 80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val
85 90 95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn
100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr
115 120 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser
130 135 140

Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala
145 150 155 160

Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His
165 170 175

Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly
180 185 190

Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile
195 200 205

Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His
210 215 220

Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln
225 230 235 240

Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr
245 250 255

Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Leu Pro Asp Val
260 265 270

Thr Pro Asn Pro Gly Gln Gly His Gln Pro Asp Asn Gly Gly Tyr His
275 280 285

Pro Ala Pro Pro Arg Pro Asn Asp Ala Ser Gln Asn Lys His Gln Arg
290 295 300

Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp Gln Leu His
305 310 315 320

Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe
325 330 335

Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro
340 345 350

His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu
355 360 365

Glu Met Glu Leu Ala Asp Arg Tyr Leu Thr Arg Pro Asn
370 375 380

<210> 25
<211> 660
<212> DNA
<213> Streptococcus agalactiae

<400> 25
atggtaaatg atatattaga aagaatgtat aaagagaata ttccaaaatc ttaccttaca 60
tccgtcccat tagttatttc tcaaaaagga agaacaacct attcgtttag tatgactggt 120
ggtcaacaaa tagatggagt gaaattcaca cagatatatg aggactatat gaaattactc 180
agtcaaggta aggatatcgc agagttatat caaaaatatt ctaaagaaga gttggcaaat 240
ctaggcatta atatttatca atccaatgat atagaaagga ctgaggaaag aacttttgat 300
gaaattatca gttgggtttc caacccttat gcaacaagac caattcaaga aaggcacact 360
attcaattag agccaacaag attttcacta gaggataaga aaagaattga agaagctgca 420
gctcaaggac taagcgaaat cgaccttatt gatttagttg acctatatga tattaattta 480
gacaatacaa gcgtcaatcg ccatattgtg gggttattga ctaataacac ccaagtaaca 540
tactatttcc aagaacaatt aaataaggag ttgctgtcaa tggctcacgc tttagataac 600
gtacaacagg cctttattaa attattaagt gaagaggaga tacgaaaatt tgctctttaa 660

<210> 26
<211> 219
<212> PRT
<213> Streptococcus agalactiae

<400> 26

Met Val Asn Asp Ile Leu Glu Arg Met Tyr Lys Glu Asn Ile Pro Lys
1 5 10 15

Ser Tyr Leu Thr Ser Val Pro Leu Val Ile Ser Gln Lys Gly Arg Thr
20 25 30

Thr Tyr Ser Phe Ser Met Thr Gly Gly Gln Gln Ile Asp Gly Val Lys
35 40 45

Phe Thr Gln Ile Tyr Glu Asp Tyr Met Lys Leu Leu Ser Gln Gly Lys
50 55 60

Asp Ile Ala Glu Leu Tyr Gln Lys Tyr Ser Lys Glu Glu Leu Ala Asn
65 70 75 80

Leu Gly Ile Asn Ile Tyr Gln Ser Asn Asp Ile Glu Arg Thr Glu Glu
85 90 95

Arg Thr Phe Asp Glu Ile Ile Ser Trp Val Ser Asn Pro Tyr Ala Thr
100 105 110

Arg Pro Ile Gln Glu Arg His Thr Ile Gln Leu Glu Pro Thr Arg Phe
115 120 125

Ser Leu Glu Asp Lys Lys Arg Ile Glu Glu Ala Ala Ala Gln Gly Leu
130 135 140

Ser Glu Ile Asp Leu Ile Asp Leu Val Asp Leu Tyr Asp Ile Asn Leu
145 150 155 160

Asp Asn Thr Ser Val Asn Arg His Ile Val Gly Leu Leu Thr Asn Asn
165 170 175

Thr Gln Val Thr Tyr Tyr Phe Gln Glu Gln Leu Asn Lys Glu Leu Leu
180 185 190

Ser Met Ala His Ala Leu Asp Asn Val Gln Gln Ala Phe Ile Lys Leu
195 200 205

Leu Ser Glu Glu Glu Ile Arg Lys Phe Ala Leu
210 215

<210> 27
<211> 653
<212> DNA
<213> Streptococcus agalactiae

<400> 27
atgaataaaa gaagaaaatt atcaaaattg aatgtaaaaa aacaacattt agcttatgga 60
gctatcactt tagtagccct ttttttcatgt attttggctg taacggtcat ctttaaaagt 120
tcacaagtta ctactgaatc tttgtcaaaa gcagataaag ttcgcgtagc caaaaaatca 180
aaaatgacta aggcgacatc taaatcaaaa gtagaagatg taaaacaggc tccaaaacct 240
tctcaggcat ctaatgaagc cccaaaatca agttctcaat ctacagaagc taattctcag 300
caacaagtta ctgcgagtga agaggcggct gtagaacaag cagttgtaac agaaaatacc 360
cctgctacca gtcaggcaca acaaacttat gctgttactg agacaactta caaacctgct 420
caacaccaga caagtggcca agtattgagc aatggaaata ctgcaggggc ggtcggatct 480
gctgctgcag cacaaatggc tgctgcaaca ggagtccctc agtctacttg ggaacatatt 540
attgcccgtg aatcaaatgg taatcctaat gttgctaatg cctcaggggc ttcaggactt 600
ttccaaacga tgccaggttg gggttcaaca gctacagttc aggatcaagt taa 653

<210> 28
<211> 234
<212> PRT
<213> Streptococcus agalactiae

<400> 28
Met Asn Lys Arg Arg Lys Leu Ser Lys Leu Asn Val Lys Lys Gln His
1 5 10 15

Leu Ala Tyr Gly Ala Ile Thr Leu Val Ala Leu Phe Ser Cys Ile Leu
20 25 30

```
Ala Val Thr Val Ile Phe Lys Ser Ser Gln Val Thr Thr Glu Ser Leu
         35                  40                  45

Ser Lys Ala Asp Lys Val Arg Val Ala Lys Lys Ser Lys Met Thr Lys
     50                  55                  60

Ala Thr Ser Lys Ser Lys Val Glu Asp Val Lys Gln Ala Pro Lys Pro
 65                  70                  75                  80

Ser Gln Ala Ser Asn Glu Ala Pro Lys Ser Ser Ser Gln Ser Thr Glu
                 85                  90                  95

Ala Asn Ser Gln Gln Gln Val Thr Ala Ser Glu Glu Ala Ala Val Glu
            100                 105                 110

Gln Ala Val Val Thr Glu Asn Thr Pro Ala Thr Ser Gln Ala Gln Gln
        115                 120                 125

Thr Tyr Ala Val Thr Glu Thr Thr Tyr Lys Pro Ala Gln His Gln Thr
    130                 135                 140

Ser Gly Gln Val Leu Ser Asn Gly Asn Thr Ala Gly Ala Val Gly Ser
145                 150                 155                 160

Ala Ala Ala Ala Gln Met Ala Ala Ala Thr Gly Val Pro Gln Ser Thr
                165                 170                 175

Trp Glu His Ile Ile Ala Arg Glu Ser Asn Gly Asn Pro Asn Val Ala
            180                 185                 190

Asn Ala Ser Gly Ala Ser Gly Leu Phe Gln Thr Met Pro Gly Trp Gly
        195                 200                 205

Ser Thr Ala Thr Val Gln Asp Gln Val Asn Ser Ala Ile Lys Ala Tyr
    210                 215                 220

Arg Ala Gln Gly Leu Ser Ala Trp Gly Tyr
225                 230
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<210> 29
<211> 360
<212> DNA
<213> Streptococcus agalactiae

<400> 29
atgattgttg gacacggaat tgatttacaa gagatagagg cgattactaa agcatatgag 60
cgtaatcaac gttttgcaga acgcgttttg accgaacaag aattgcttct ttttaaagga 120
atttccaatc ccaagcgtca gatgtctttt ttaacagggc gatgggcagc aaaagaggct 180
tatagcaaag cacttggaac aggaattggg aaagttaatt ttcatgatat cgaaatttta 240
tcggatgata aaggagcgcc tttgattaca aaagaaccgt ttaatggaaa atcttttgtt 300
tcaatatctc atagtggtaa ttatgcacaa gctagtgtta ttttggagga agaaaaatga 360

<210> 30
<211> 119
<212> PRT
<213> Streptococcus agalactiae

<400> 30
Met Ile Val Gly His Gly Ile Asp Leu Gln Glu Ile Glu Ala Ile Thr
1 5 10 15

Lys Ala Tyr Glu Arg Asn Gln Arg Phe Ala Glu Arg Val Leu Thr Glu
20 25 30

Gln Glu Leu Leu Leu Phe Lys Gly Ile Ser Asn Pro Lys Arg Gln Met
35 40 45

Ser Phe Leu Thr Gly Arg Trp Ala Ala Lys Glu Ala Tyr Ser Lys Ala
50 55 60

Leu Gly Thr Gly Ile Gly Lys Val Asn Phe His Asp Ile Glu Ile Leu
65 70 75 80

Ser Asp Asp Lys Gly Ala Pro Leu Ile Thr Lys Glu Pro Phe Asn Gly
85 90 95

Lys Ser Phe Val Ser Ile Ser His Ser Gly Asn Tyr Ala Gln Ala Ser
100 105 110

Val Ile Leu Glu Glu Glu Lys
115

<210> 31
<211> 474
<212> DNA
<213> Streptococcus agalactiae

<400> 31
atgatttttg tcacagtggg gacacatgaa cagcagttca accgtcttat taaagaagtt 60
gatagattaa aagggacagg tgctattgat caagaagtgt tcattcaaac gggttactca 120
gacttcgaac ctcagaattg tcagtggtca aaatttctct catatgatga tatgaactct 180
tacatgaaag aagctgagat tgttatcaca catggcggcc cagcgacgtt tatgtcagtt 240
atttctttag ggaaattacc agttgttgtt cctaggagaa agcagtttgg tgaacatatc 300
aatgatcatc aaatacaatt tttaaaaaaa attgcccacc tgtatccctt ggcttggatt 360
gaagatgtag atggacttgc ggaagcgttg aaaaggaata tagctacaga aaaatatcag 420
ggaaataatg atatgttttg tcataaatta gaaaaaatta taggtgaaat atga 474

<210> 32
<211> 157
<212> PRT
<213> Streptococcus agalactiae

<400> 32
Met Ile Phe Val Thr Val Gly Thr His Glu Gln Gln Phe Asn Arg Leu
1 5 10 15

Ile Lys Glu Val Asp Arg Leu Lys Gly Thr Gly Ala Ile Asp Gln Glu
20 25 30

Val Phe Ile Gln Thr Gly Tyr Ser Asp Phe Glu Pro Gln Asn Cys Gln
35 40 45

Trp Ser Lys Phe Leu Ser Tyr Asp Asp Met Asn Ser Tyr Met Lys Glu
50 55 60

Ala Glu Ile Val Ile Thr His Gly Gly Pro Ala Thr Phe Met Ser Val
65 70 75 80

Ile Ser Leu Gly Lys Leu Pro Val Val Val Pro Arg Arg Lys Gln Phe
85 90 95

Gly Glu His Ile Asn Asp His Gln Ile Gln Phe Leu Lys Lys Ile Ala
100 105 110

His Leu Tyr Pro Leu Ala Trp Ile Glu Asp Val Asp Gly Leu Ala Glu
115 120 125

Ala Leu Lys Arg Asn Ile Ala Thr Glu Lys Tyr Gln Gly Asn Asn Asp
130 135 140

Met Phe Cys His Lys Leu Glu Lys Ile Ile Gly Glu Ile
145 150 155

<210> 33
<211> 1203
<212> DNA
<213> Streptococcus agalactiae

<400> 33
ttggaagaca aattattcaa caaacatttt ataggcatta ctattttaaa ctttattgtt 60
tatatggtct attatttgtt caccgttatc atagcttttа ttgcgactaa agagttaggt 120
gttagcacta gccaagcagg attagcaacg gggatttata ttgtagggac tttgattgct 180
cgtcttatat ttggtaagca attagaagtt ctaggacgta agttagtttt acgtggaggg 240
gctatttttt acttactaac aactttagct tatttttata tgccaagtat cggagtaatg 300
tatttagttc gtttcctaaa tggttttggt tatggcgtcg tgtcaacagc aactaatact 360

attgtaacag cctatatacc agctgataaa agaggtgagg ggattaactt ttacggtcta 420
tcaacaagtt tagccgcagc tattggtcct tttgtaggaa catttatgct agacaacctt 480
catattaact ttaaaatggt tattgtatta tgtagtattt taattgcgat tgtagtgttg 540
ggagcatttg ttttcccagt caaaaatatt actttaaatc cagaacagtt agctaaatca 600
aaatcatgga ctattgatag tttcattgag aaaaaagcaa tttttatcac aattattgca 660
tttttgatgg gtatctccta tgcttccgtg ttaggtttcc aaaaattata tacaacagaa 720
attaatttga tgacagtagg agcttatttc tttattgttt atgcacttgt catcacttta 780
accagaccat ctatgggaag attaatggac gctaagggag ataagtgggt gctttatcca 840
agttatctgt tcttaacttt gggacttgct ttattaggga gtgctatggg aagtgttacc 900
taccttctat caggtgcttt gattggtttt ggttatggca cctttatgtc ttgtggccaa 960
gcagcatcaa tcaaaggtgt tgaggaacat cgtttcaata cagccatgtc aacttacatg 1020
ataggtcttg atttagggtt aggtgctgga ccttacattt tgggacttgt taaagatggt 1080
tttcttggag ctggtgtgca atcctttaga gaattattct ggatagcagc gattattcct 1140
gttgtttgtg gtattctata tttcttaaaa tcatctagac aagttgaaac taaaactata 1200
taa 1203

<210> 34
<211> 400
<212> PRT
<213> Streptococcus agalactiae

<400> 34
Met Glu Asp Lys Leu Phe Asn Lys His Phe Ile Gly Ile Thr Ile Leu
1 5 10 15

Asn Phe Ile Val Tyr Met Val Tyr Tyr Leu Phe Thr Val Ile Ile Ala
20 25 30

Phe Ile Ala Thr Lys Glu Leu Gly Val Ser Thr Ser Gln Ala Gly Leu
35 40 45

Ala Thr Gly Ile Tyr Ile Val Gly Thr Leu Ile Ala Arg Leu Ile Phe
50 55 60

Gly Lys Gln Leu Glu Val Leu Gly Arg Lys Leu Val Leu Arg Gly Gly
65 70 75 80

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Ala Ile Phe Tyr Leu Leu Thr Thr Leu Ala Tyr Phe Tyr Met Pro Ser
                 85                  90                  95

Ile Gly Val Met Tyr Leu Val Arg Phe Leu Asn Gly Phe Gly Tyr Gly
            100                 105                 110

Val Val Ser Thr Ala Thr Asn Thr Ile Val Thr Ala Tyr Ile Pro Ala
        115                 120                 125

Asp Lys Arg Gly Glu Gly Ile Asn Phe Tyr Gly Leu Ser Thr Ser Leu
    130                 135                 140

Ala Ala Ala Ile Gly Pro Phe Val Gly Thr Phe Met Leu Asp Asn Leu
145                 150                 155                 160

His Ile Asn Phe Lys Met Val Ile Val Leu Cys Ser Ile Leu Ile Ala
                165                 170                 175

Ile Val Val Leu Gly Ala Phe Val Phe Pro Val Lys Asn Ile Thr Leu
            180                 185                 190

Asn Pro Glu Gln Leu Ala Lys Ser Lys Ser Trp Thr Ile Asp Ser Phe
        195                 200                 205

Ile Glu Lys Lys Ala Ile Phe Ile Thr Ile Ile Ala Phe Leu Met Gly
    210                 215                 220

Ile Ser Tyr Ala Ser Val Leu Gly Phe Gln Lys Leu Tyr Thr Thr Glu
225                 230                 235                 240

Ile Asn Leu Met Thr Val Gly Ala Tyr Phe Phe Ile Val Tyr Ala Leu
                245                 250                 255

Val Ile Thr Leu Thr Arg Pro Ser Met Gly Arg Leu Met Asp Ala Lys
            260                 265                 270

Gly Asp Lys Trp Val Leu Tyr Pro Ser Tyr Leu Phe Leu Thr Leu Gly
        275                 280                 285
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Leu Ala Leu Leu Gly Ser Ala Met Gly Ser Val Thr Tyr Leu Leu Ser
    290                 295                 300

Gly Ala Leu Ile Gly Phe Gly Tyr Gly Thr Phe Met Ser Cys Gly Gln
305                 310                 315                 320

Ala Ala Ser Ile Lys Gly Val Glu Glu His Arg Phe Asn Thr Ala Met
                325                 330                 335

Ser Thr Tyr Met Ile Gly Leu Asp Leu Gly Leu Gly Ala Gly Pro Tyr
            340                 345                 350

Ile Leu Gly Leu Val Lys Asp Gly Phe Leu Gly Ala Gly Val Gln Ser
        355                 360                 365

Phe Arg Glu Leu Phe Trp Ile Ala Ala Ile Ile Pro Val Val Cys Gly
    370                 375                 380

Ile Leu Tyr Phe Leu Lys Ser Ser Arg Gln Val Glu Thr Lys Thr Ile
385                 390                 395                 400
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<210> 35
<211> 393
<212> DNA
<213> Streptococcus agalactiae

<400> 35
atgaatagtg aacctaaaag tcagtcaaac gaagtaaaaa atagcaagca atcagaagtg 60
aagaaagata aaaaaatgac aaaaaaagaa caattagcct atctcaaaga gcatgagcaa 120
gaaatcatag attatgtaaa attacataac aaccaaattg agtccgttca attcgattgg 180
tcaagtgtaa aagtagaaca aagcgggaat ggaactccac aagggggtga ttataatctt 240
tcactgagag gaaagtttaa tcatctacaa aattcaaaat taatagttga tttttattta 300
gctcataaaa atgatatccc aaatatcaaa tcaatgggaa tgctaaataa gccatatata 360

cataaaaatg gtatttggca catttatgaa tag 393

<210> 36
<211> 137
<212> PRT
<213> Streptococcus agalactiae

<400> 36

Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu Pro Lys Ser Gln Ser
1 5 10 15

Asn Glu Val Lys Asn Ser Lys Gln Ser Glu Val Lys Lys Asp Lys Lys
20 25 30

Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His Glu Gln Glu
35 40 45

Ile Ile Asp Tyr Val Lys Leu His Asn Asn Gln Ile Glu Ser Val Gln
50 55 60

Phe Asp Trp Ser Ser Val Lys Val Glu Gln Ser Gly Asn Gly Thr Pro
65 70 75 80

Gln Gly Gly Asp Tyr Asn Leu Ser Leu Arg Gly Lys Phe Asn His Leu
85 90 95

Gln Asn Ser Lys Leu Ile Val Asp Phe Tyr Leu Ala His Lys Asn Asp
100 105 110

Ile Pro Asn Ile Lys Ser Met Gly Met Leu Asn Lys Pro Tyr Ile His
115 120 125

Lys Asn Gly Ile Trp His Ile Tyr Glu
130 135

<210> 37
<211> 927
<212> DNA
<213> Streptococcus agalactiae

<400> 37
atgaaaaaga ttcgattatc aaagtttatt aaaatgattg ttgttatttt gtttttaatt 60
agtgtagcag ctagttttta ttttttccac gttgcccaag ttcgagatga taaatccttt 120
atttcaaatg gtcaacgtaa gcctggaaac tctttatatg cttatgataa atcctttgat 180
aagctattaa agcaaaaaat agaaatgaca aaccaaaata taaagcaagt tgcttggtat 240
gttcctgctg ctaagaaaac tcataagaca gttgttgtcg ttcatggttt tgcgaatagc 300
aaagagaata tgaaggcata tggttggctg tttcataagt taggatacaa tgttcttatg 360
cctgacaaca ttgcacatgg tgaaagtcat gggcagttga taggctatgg ctggaacgac 420
cgcgagaaca ttatcaaatg gacagaaatg atagtggata agaatccatc aagccaaatt 480
actttatttg gtgtttcaat gggtggagca acagtcatga tggctagtgg tgaaaaatta 540
cctagtcagg ttgttaatat cattgaagat tgtggttatt ctagtgtttg ggatgaatta 600
aaatttcagg ctaaagagat gtatggttta ccagccttcc cactcttata tgaagtttca 660
acaatttcta aaatcagagc aggtttttcg tatggacaag caagtagtgt cgaacaattg 720
aaaaagaata atttaccagc cctctttatt catggtgata aggataattt tgttccaaca 780
agtatggttt atgacaacta taaagctaca gcaggtaaga aagagcttta tattgtaaaa 840
ggggcaaaac atgcgaaatc ttttgaaaca gagccagaaa aatatgagaa acgtatctct 900
agttttttga aaaaatatga aaaataa 927

<210> 38
<211> 308
<212> PRT
<213> Streptococcus agalactiae

<400> 38
Met Lys Lys Ile Arg Leu Ser Lys Phe Ile Lys Met Ile Val Val Ile
1 5 10 15

Leu Phe Leu Ile Ser Val Ala Ala Ser Phe Tyr Phe Phe His Val Ala
20 25 30

Gln Val Arg Asp Asp Lys Ser Phe Ile Ser Asn Gly Gln Arg Lys Pro
35 40 45

Gly Asn Ser Leu Tyr Ala Tyr Asp Lys Ser Phe Asp Lys Leu Leu Lys
50 55 60

Gln Lys Ile Glu Met Thr Asn Gln Asn Ile Lys Gln Val Ala Trp Tyr
65 70 75 80

Val Pro Ala Ala Lys Lys Thr His Lys Thr Val Val Val Val His Gly
85 90 95

Phe Ala Asn Ser Lys Glu Asn Met Lys Ala Tyr Gly Trp Leu Phe His
100 105 110

Lys Leu Gly Tyr Asn Val Leu Met Pro Asp Asn Ile Ala His Gly Glu
115 120 125

Ser His Gly Gln Leu Ile Gly Tyr Gly Trp Asn Asp Arg Glu Asn Ile
130 135 140

Ile Lys Trp Thr Glu Met Ile Val Asp Lys Asn Pro Ser Ser Gln Ile
145 150 155 160

Thr Leu Phe Gly Val Ser Met Gly Gly Ala Thr Val Met Met Ala Ser
165 170 175

Gly Glu Lys Leu Pro Ser Gln Val Val Asn Ile Ile Glu Asp Cys Gly
180 185 190

Tyr Ser Ser Val Trp Asp Glu Leu Lys Phe Gln Ala Lys Glu Met Tyr
195 200 205

Gly Leu Pro Ala Phe Pro Leu Leu Tyr Glu Val Ser Thr Ile Ser Lys
210 215 220

Ile Arg Ala Gly Phe Ser Tyr Gly Gln Ala Ser Ser Val Glu Gln Leu
225 230 235 240

Lys Lys Asn Asn Leu Pro Ala Leu Phe Ile His Gly Asp Lys Asp Asn
245 250 255

Phe Val Pro Thr Ser Met Val Tyr Asp Asn Tyr Lys Ala Thr Ala Gly
260 265 270

Lys Lys Glu Leu Tyr Ile Val Lys Gly Ala Lys His Ala Lys Ser Phe
275 280 285

Glu Thr Glu Pro Glu Lys Tyr Glu Lys Arg Ile Ser Ser Phe Leu Lys
290 295 300

Lys Tyr Glu Lys
305

<210> 39
<211> 546
<212> DNA
<213> Streptococcus agalactiae

<400> 39
ttgaggagta atatggtaaa gacagcagtt ttaatggcga catacaatgg cgaaaaattt 60
atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120
agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180
gagttagaag gctggaaaat tgttaaaaac gacaaaaact taggctggcg tttaaatttt 240
cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300
gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360
caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420
ccacattttc taacttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480
tatcaaacat tccgtcccgg atggaccatt gctatgaaga gagattttgc gcaagctatc 540
gcttga 546

<210> 40
<211> 181
<212> PRT
<213> Streptococcus agalactiae

<400> 40

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Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn
 1               5                  10                  15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr
            20                  25                  30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu
        35                  40                  45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly
    50                  55                  60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe
65                  70                  75                  80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe
                85                  90                  95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln
            100                 105                 110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp
        115                 120                 125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu
    130                 135                 140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp
145                 150                 155                 160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe
                165                 170                 175
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Ala Gln Ala Ile Ala
180

<210> 41
<211> 579
<212> DNA
<213> Streptococcus agalactiae

<400> 41
atgattcatg agattcacga ttgtcaattt attgaaaaag gaagttacgt ttatttgaat 60
tatattaatg ctgagggcga gagagtagtt attataatca tagattttgt ccgtagtgtt 120
agtcctattt tatatcgtct atttatgatt ttacttgcac aagaagtacc tcacttgcat 180
gattacatct ataatgcaag agatgatcac tacgatactt ggaagtttaa agaattaaag 240
gagtcaaacc atccagtcct tttggcattc tctgaaaggt ggcacgatag tcgcttgact 300
tctaaaagcc ttgcagaatg tttacaatta accgaccttg atgaagaagt gaaatcgacc 360
atcattcaat taagacagtt cgaaaaatca gtcagaaatc ctttggctca cctgattaaa 420
ccttttgatg agcaagaact atatcgtaca actcaatttt cttctcaagc atttttagac 480
cagattatct tcttggcaaa ggtaattggt gttgagtatg atactgttaa ttttcactac 540
gatacggtta acaagcttat tataaagata cttgagtaa 579

<210> 42
<211> 192
<212> PRT
<213> Streptococcus agalactiae

<400> 42
Met Ile His Glu Ile His Asp Cys Gln Phe Ile Glu Lys Gly Ser Tyr
1 5 10 15

Val Tyr Leu Asn Tyr Ile Asn Ala Glu Gly Glu Arg Val Val Ile Ile
20 25 30

Ile Ile Asp Phe Val Arg Ser Val Ser Pro Ile Leu Tyr Arg Leu Phe
35 40 45

Met Ile Leu Leu Ala Gln Glu Val Pro His Leu His Asp Tyr Ile Tyr
50 55 60

Asn Ala Arg Asp Asp His Tyr Asp Thr Trp Lys Phe Lys Glu Leu Lys
65 70 75 80

Glu Ser Asn His Pro Val Leu Leu Ala Phe Ser Glu Arg Trp His Asp
85 90 95

Ser Arg Leu Thr Ser Lys Ser Leu Ala Glu Cys Leu Gln Leu Thr Asp
100 105 110

Leu Asp Glu Glu Val Lys Ser Thr Ile Ile Gln Leu Arg Gln Phe Glu
115 120 125

Lys Ser Val Arg Asn Pro Leu Ala His Leu Ile Lys Pro Phe Asp Glu
130 135 140

Gln Glu Leu Tyr Arg Thr Thr Gln Phe Ser Ser Gln Ala Phe Leu Asp
145 150 155 160

Gln Ile Ile Phe Leu Ala Lys Val Ile Gly Val Glu Tyr Asp Thr Val
165 170 175

Asn Phe His Tyr Asp Thr Val Asn Lys Leu Ile Ile Lys Ile Leu Glu
180 185 190

<210> 43
<211> 465
<212> DNA
<213> Streptococcus agalactiae

<400> 43
atggtaaaag tttcaaattt agggtatcca cgtcttggtg aacagcgcga atggaagcaa 60
gcgatcgaag ctttctgggc agggaatctt gaacaaaaag atttagaaaa acaactaaaa 120
caattacgta tcaatcattt aaagaaacaa aaagaggcag gtattgacct tattccagtg 180

ggggattttt cttgttatga tcatgttttg gatttgtcat ttcaattcaa tgtaatccca 240
aagcgtttcg atgagtatga gaggaattta gacctttatt ttgctattgc aagaggtgac 300
aaagataatg tcgcatcatc tatgaaaaag tggtttaata ccaactacca ctacatagtc 360
ccagaatggg aggttgagac taaacctcac ttgcagaata attacttact tgatctttat 420
ctagaagcta gggaagtagt tggtgataaa gcaaagccgg ttatc 465

<210> 44
<211> 159
<212> PRT
<213> Streptococcus agalactiae

<400> 44

Met Glu Glu Ile Met Val Lys Val Ser Asn Leu Gly Tyr Pro Arg Leu
1 5 10 15

Gly Glu Gln Arg Glu Trp Lys Gln Ala Ile Glu Ala Phe Trp Ala Gly
20 25 30

Asn Leu Glu Gln Lys Asp Leu Glu Lys Gln Leu Lys Gln Leu Arg Ile
35 40 45

Asn His Leu Lys Lys Gln Lys Glu Ala Gly Ile Asp Leu Ile Pro Val
50 55 60

Gly Asp Phe Ser Cys Tyr Asp His Val Leu Asp Leu Ser Phe Gln Phe
65 70 75 80

Asn Val Ile Pro Lys Arg Phe Asp Glu Tyr Glu Arg Asn Leu Asp Leu
85 90 95

Tyr Phe Ala Ile Ala Arg Gly Asp Lys Asp Asn Val Ala Ser Ser Met
100 105 110

Lys Lys Trp Phe Asn Thr Asn Tyr His Tyr Ile Val Pro Glu Trp Glu
115 120 125

Val Glu Thr Lys Pro His Leu Gln Asn Asn Tyr Leu Leu Asp Leu Tyr
130 135 140

Leu Glu Ala Arg Glu Val Val Gly Asp Lys Ala Lys Pro Val Ile
145 150 155

<210> 45
<211> 124
<212> DNA
<213> Streptococcus agalactiae

<400> 45
atggtgttac ttttattgct aatggtagcc aagtcaagtt tgatggttac atggctgttt 60
ataacgatac tgacaaaaat aaaatgttac cagatatgga ggaaggagaa agttatcaag 120
ttaa 124

<210> 46
<211> 41
<212> PRT
<213> Streptococcus agalactiae

<400> 46
Met Val Leu Leu Leu Leu Leu Met Val Ala Lys Ser Ser Leu Met Val
1 5 10 15

Thr Trp Leu Phe Ile Thr Ile Leu Thr Lys Ile Lys Cys Tyr Gln Ile
20 25 30

Trp Arg Lys Glu Lys Val Ile Lys Leu
35 40

<210> 47
<211> 669
<212> DNA
<213> Streptococcus agalactiae

<400> 47
atgaacaaaa aaatttccgg gatcggcttg gcttcgattg cagtacttag tttagctgca 60
tgtggacatc gtggtgcttc taaatctggt ggtaaatcag atagcttgaa ggttgcaatg 120
gtaacagata ccggtggtgt tgatgataaa tcatttaacc aatctggttg ggaaggtatg 180
caagcttggg gcaagaagaa tggccttaaa aaaggagctg gttttgacta tttccaatcg 240
gcaagtgaat ctgattatgc aactaactta gatacagctg tgtctagtgg ttataaattg 300
attttcggta ttggattttc tcttcatgat gctattgata aagcagcaga caataacaaa 360
gatgttaatt acgtcatcgt tgatgatgtt attaaaggga aagataatgt tgcaagtgtt 420
gtctttgcgg ataatgaatc agcttactta gcaggtattg cagccgctaa aactaccaaa 480
acaaaaacag ttggctttgt aggtggtatg gaatctgagg ttattacccg ttttgaaaaa 540
ggttttgaag caggtgtcaa atcagttgat aaatcaatta aaattaaagt tgactatgct 600
ggttcattcg gtgatgctgc taagggtaag acaattgcag ccgcacaata tgcttctggc 660
gcagatatt 669

<210> 48
<211> 223
<212> PRT
<213> Streptococcus agalactiae

<400> 48
Met Asn Lys Lys Ile Ser Gly Ile Gly Leu Ala Ser Ile Ala Val Leu
1 5 10 15

Ser Leu Ala Ala Cys Gly His Arg Gly Ala Ser Lys Ser Gly Gly Lys
20 25 30

Ser Asp Ser Leu Lys Val Ala Met Val Thr Asp Thr Gly Gly Val Asp
35 40 45

Asp Lys Ser Phe Asn Gln Ser Gly Trp Glu Gly Met Gln Ala Trp Gly
50 55 60

Lys Lys Asn Gly Leu Lys Lys Gly Ala Gly Phe Asp Tyr Phe Gln Ser
65 70 75 80

Ala Ser Glu Ser Asp Tyr Ala Thr Asn Leu Asp Thr Ala Val Ser Ser
85 90 95

Gly Tyr Lys Leu Ile Phe Gly Ile Gly Phe Ser Leu His Asp Ala Ile
100 105 110

Asp Lys Ala Ala Asp Asn Asn Lys Asp Val Asn Tyr Val Ile Val Asp
115 120 125

Asp Val Ile Lys Gly Lys Asp Asn Val Ala Ser Val Val Phe Ala Asp
130 135 140

Asn Glu Ser Ala Tyr Leu Ala Gly Ile Ala Ala Ala Lys Thr Thr Lys
145 150 155 160

Thr Lys Thr Val Gly Phe Val Gly Gly Met Glu Ser Glu Val Ile Thr
165 170 175

Arg Phe Glu Lys Gly Phe Glu Ala Gly Val Lys Ser Val Asp Lys Ser
180 185 190

Ile Lys Ile Lys Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala Lys
195 200 205

Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ser Gly Ala Asp Ile
210 215 220

<210> 49
<211> 609
<212> DNA
<213> Streptococcus agalactiae

<400> 49
atgttacatt ctaaaaaaat acattcctta tcgcttattg ccgttctctc tttagcaaca 60

tatacgagtt tacaaccaaa tcatgtagcg gctgaacaat cacaaaaaac atcaactgtt 120
cttatgagtc aaaaaactat tgaacataag ttaaaagttg cagataaaga agctgctcct 180
ctctacgcta aaatcgacca tatccaacga catattgaag tcaaaaaagc aaaagattta 240
aaagttattg aattgtatat taacaaagat atcaaccaac tagagaagca aaataaacgt 300
ctactaacta aattctatac ttctattgat aatcaaacat gggatagcac aagtgaagtc 360
aaaaaattga ttgataagac aaccctatcc actaacgaaa aagatagatt aaaattatat 420
tttgaacaac gtgcttacct tgagacaagg ttgaacgacc gctatcaaaa atttgataac 480
tctattgaaa accaaaataa agaactaaaa atattaacgt caaaaataga aaaaatctat 540
caaaaacatg gtattacaaa agaggtatta aaaacttact atgctaaaaa aacagtacga 600
gctgactga 609

<210> 50
<211> 202
<212> PRT
<213> Streptococcus agalactiae

<400> 50
Met Leu His Ser Lys Lys Ile His Ser Leu Ser Leu Ile Ala Val Leu
1 5 10 15

Ser Leu Ala Thr Tyr Thr Ser Leu Gln Pro Asn His Val Ala Ala Glu
20 25 30

Gln Ser Gln Lys Thr Ser Thr Val Leu Met Ser Gln Lys Thr Ile Glu
35 40 45

His Lys Leu Lys Val Ala Asp Lys Glu Ala Ala Pro Leu Tyr Ala Lys
50 55 60

Ile Asp His Ile Gln Arg His Ile Glu Val Lys Lys Ala Lys Asp Leu
65 70 75 80

Lys Val Ile Glu Leu Tyr Ile Asn Lys Asp Ile Asn Gln Leu Glu Lys
85 90 95

Gln Asn Lys Arg Leu Leu Thr Lys Phe Tyr Thr Ser Ile Asp Asn Gln
100 105 110

Thr Trp Asp Ser Thr Ser Glu Val Lys Lys Leu Ile Asp Lys Thr Thr
115 120 125

Leu Ser Thr Asn Glu Lys Asp Arg Leu Lys Leu Tyr Phe Glu Gln Arg
130 135 140

Ala Tyr Leu Glu Thr Arg Leu Asn Asp Arg Tyr Gln Lys Phe Asp Asn
145 150 155 160

Ser Ile Glu Asn Gln Asn Lys Glu Leu Lys Ile Leu Thr Ser Lys Ile
165 170 175

Glu Lys Ile Tyr Gln Lys His Gly Ile Thr Lys Glu Val Leu Lys Thr
180 185 190

Tyr Tyr Ala Lys Lys Thr Val Arg Ala Asp
195 200

<210> 51
<211> 600
<212> DNA
<213> Streptococcus agalactiae

<400> 51
ctgaattccc aaaaacgcta caatcaaact tggtatccta cttatggttt ttctgatact 60
tatgcattca tggttactaa agagtttgcc agacagaata aaatcaccaa gatctctgat 120
ctcaaaaagt tatcaacaac tatgaaggca ggggttgata gttcatggat gaatcgcgag 180
ggagatggat acactgattt cgctaaaaca tacggttttg aattttcaca tatttaccct 240
atgcaaattg gcttagtcta tgatgcggtt gaaagtaaca aaatgcaatc tgtattaggc 300
tactccactg acggtcgtat ttcgagctat gatttagaaa ttttaaggga tgataaaaaa 360
ttctttcctc cttatgaagc ctctatggtt gtcaacaatt ctatcatcaa aaaagatcct 420
aaactaaaaa aattactcca tcgactcgat ggtaaaatca atttaaaaac gatgcaaaac 480
cttaattata tggtagatga taaactttta gaagcttggc gtaatcatgg tcatagctgt 540
ttcctgtgtg aaattgttat ccgctcacaa ttccacacaa catacgagcc ggaagcataa 600

<210> 52
<211> 199
<212> PRT
<213> Streptococcus agalactiae

<400> 52

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Leu Asn Ser Gln Lys Arg Tyr Asn Gln Thr Trp Tyr Pro Thr Tyr Gly
 1               5                  10                  15

Phe Ser Asp Thr Tyr Ala Phe Met Val Thr Lys Glu Phe Ala Arg Gln
            20                  25                  30

Asn Lys Ile Thr Lys Ile Ser Asp Leu Lys Lys Leu Ser Thr Thr Met
        35                  40                  45

Lys Ala Gly Val Asp Ser Ser Trp Met Asn Arg Glu Gly Asp Gly Tyr
    50                  55                  60

Thr Asp Phe Ala Lys Thr Tyr Gly Phe Glu Phe Ser His Ile Tyr Pro
65                  70                  75                  80

Met Gln Ile Gly Leu Val Tyr Asp Ala Val Glu Ser Asn Lys Met Gln
                85                  90                  95

Ser Val Leu Gly Tyr Ser Thr Asp Gly Arg Ile Ser Ser Tyr Asp Leu
            100                 105                 110

Glu Ile Leu Arg Asp Asp Lys Lys Phe Phe Pro Pro Tyr Glu Ala Ser
        115                 120                 125

Met Val Val Asn Asn Ser Ile Ile Lys Lys Asp Pro Lys Leu Lys Lys
    130                 135                 140

Leu Leu His Arg Leu Asp Gly Lys Ile Asn Leu Lys Thr Met Gln Asn
145                 150                 155                 160

Leu Asn Tyr Met Val Asp Asp Lys Leu Leu Glu Ala Trp Arg Asn His
                165                 170                 175
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Gly His Ser Cys Phe Leu Cys Glu Ile Val Ile Arg Ser Gln Phe His
180 185 190

Thr Thr Tyr Glu Pro Glu Ala
195

<210> 53
<211> 849
<212> DNA
<213> Streptococcus agalactiae

<400> 53
atgaaaaaat tactttccct aacatgtcta atcatgatgt ctttatgttt agtggcatgt 60
actaagcaag caatgtcgtc taagcaagca atgtcgtcta agcaaattaa agataagaat 120
agtaaagaaa aggtgattac tgttgcaact tacagcaaac ctacatctac ctttttagat 180
ttgattaaag ataatgtaaa agaaaaagga tatactttaa aggttgtcat ggtctctgac 240
tatattcagg ctaacattgc tttagaaaac aaagaacatg atgctaacct tttacaacat 300
gaatttttca tgagtatctt taataaggaa aatgatggtc atctagtgtc aattacacca 360
atttatcatt cattggctgg tttttatggt caacatttga aaaatattgc cgagcttaaa 420
gacggtgcta aggtagcgat tccgtctgat cctgccaata tgactagagc tctgctatta 480
ttgcaagaaa agaaacttat caccttaaag aatacgtcca aaaagaccaa ggctatcgaa 540
gatattatta ctaaccctaa aaaattacga attgaacctg tagcattact taacctcaat 600
caggcctatt ttgaatatga ccttgtcttt aatttccctg gatatgtgac aaaaatcaat 660
ctagttccta aaagggatag attattatat gagaaaaaac cagatatccg ttttgcaggt 720
gccttggtag ctcgtgaaga taataaaaat agtgataaaa taaaagtact taaagaagta 780
ctaacaagta aagagattcg tcactatatc actaaggaga ttccaagtga agcagacgtt 840
gcgttctag 849

<210> 54
<211> 282
<212> PRT
<213> Streptococcus agalactiae

<400> 54
Met Lys Lys Leu Leu Ser Leu Thr Cys Leu Ile Met Met Ser Leu Cys
1 5 10 15

Leu Val Ala Cys Thr Lys Gln Ala Met Ser Ser Lys Gln Ala Met Ser
20 25 30

Ser Lys Gln Ile Lys Asp Lys Asn Ser Lys Glu Lys Val Ile Thr Val
35 40 45

Ala Thr Tyr Ser Lys Pro Thr Ser Thr Phe Leu Asp Leu Ile Lys Asp
50 55 60

Asn Val Lys Glu Lys Gly Tyr Thr Leu Lys Val Val Met Val Ser Asp
65 70 75 80

Tyr Ile Gln Ala Asn Ile Ala Leu Glu Asn Lys Glu His Asp Ala Asn
85 90 95

Leu Leu Gln His Glu Phe Phe Met Ser Ile Phe Asn Lys Glu Asn Asp
100 105 110

Gly His Leu Val Ser Ile Thr Pro Ile Tyr His Ser Leu Ala Gly Phe
115 120 125

Tyr Gly Gln His Leu Lys Asn Ile Ala Glu Leu Lys Asp Gly Ala Lys
130 135 140

Val Ala Ile Pro Ser Asp Pro Ala Asn Met Thr Arg Ala Leu Leu Leu
145 150 155 160

Leu Gln Glu Lys Lys Leu Ile Thr Leu Lys Asn Thr Ser Lys Lys Thr
165 170 175

Lys Ala Ile Glu Asp Ile Ile Thr Asn Pro Lys Lys Leu Arg Ile Glu
180 185 190

Pro Val Ala Leu Leu Asn Leu Asn Gln Ala Tyr Phe Glu Tyr Asp Leu
195 200 205

Val Phe Asn Phe Pro Gly Tyr Val Thr Lys Ile Asn Leu Val Pro Lys
210 215 220

Arg Asp Arg Leu Leu Tyr Glu Lys Lys Pro Asp Ile Arg Phe Ala Gly
225 230 235 240

Ala Leu Val Ala Arg Glu Asp Asn Lys Asn Ser Asp Lys Ile Lys Val
245 250 255

Leu Lys Glu Val Leu Thr Ser Lys Glu Ile Arg His Tyr Ile Thr Lys
260 265 270

Glu Ile Pro Ser Glu Ala Asp Val Ala Phe
275 280

<210> 55
<211> 711
<212> DNA
<213> Streptococcus agalactiae

<400> 55
ctgttggcta aggaaaccac tatgtctgtc ctttggtatc aaaattctgc agaagccaag 60
gctttatatt tacaaggtta taatgttgct aaaatgaagt tagatgattg gttacaaaag 120
cccagtgaaa aaccatattc aattatctta gatttagatg aaacagtttt agataatagc 180
ccatatcaag caaagaatat taaagatggc tctagtttca cgccagagag ttgggataaa 240
tgggtgcaaa agaaatcagc taaggctgtt gcgggtgcca aagaattttt gaagtatgct 300
aatgaaaagg gaataaaaat ttattatgtc tcagatcgta cagatgctca agttgatgcg 360
actaaagaaa atttagagaa ggaaggtata cctgttcaag ggaaagacca cttgcttttc 420
cttaaaaaag gaatgaaatc taaagagagt cgccgtcagg cagttcaaaa agataccaat 480
ttaattatgc tttttggaga taatttagtt gattttgctg atttttctaa atcatctagt 540
acagatagag aacaactact aactaaactt caaagtgagt ttggtagtaa atttattgtt 600
ttcccaaatc ctatgtacgg ttcttgggaa agtgctattt atcaaggaaa acatctggat 660
gttcaaaaac aattgaaaga acgacaaaaa atgttgcatt cgtatgatta a 711

<210> 56
<211> 236
<212> PRT
<213> Streptococcus agalactiae

<400> 56

Leu Leu Ala Lys Glu Thr Thr Met Ser Val Leu Trp Tyr Gln Asn Ser
1 5 10 15

Ala Glu Ala Lys Ala Leu Tyr Leu Gln Gly Tyr Asn Val Ala Lys Met
20 25 30

Lys Leu Asp Asp Trp Leu Gln Lys Pro Ser Glu Lys Pro Tyr Ser Ile
35 40 45

Ile Leu Asp Leu Asp Glu Thr Val Leu Asp Asn Ser Pro Tyr Gln Ala
50 55 60

Lys Asn Ile Lys Asp Gly Ser Ser Phe Thr Pro Glu Ser Trp Asp Lys
65 70 75 80

Trp Val Gln Lys Lys Ser Ala Lys Ala Val Ala Gly Ala Lys Glu Phe
85 90 95

Leu Lys Tyr Ala Asn Glu Lys Gly Ile Lys Ile Tyr Tyr Val Ser Asp
100 105 110

Arg Thr Asp Ala Gln Val Asp Ala Thr Lys Glu Asn Leu Glu Lys Glu
115 120 125

Gly Ile Pro Val Gln Gly Lys Asp His Leu Leu Phe Leu Lys Lys Gly
130 135 140

Met Lys Ser Lys Glu Ser Arg Arg Gln Ala Val Gln Lys Asp Thr Asn
145 150 155 160

Leu Ile Met Leu Phe Gly Asp Asn Leu Val Asp Phe Ala Asp Phe Ser
165 170 175

Lys Ser Ser Ser Thr Asp Arg Glu Gln Leu Leu Thr Lys Leu Gln Ser
180 185 190

Glu Phe Gly Ser Lys Phe Ile Val Phe Pro Asn Pro Met Tyr Gly Ser
195 200 205

Trp Glu Ser Ala Ile Tyr Gln Gly Lys His Leu Asp Val Gln Lys Gln
210 215 220

Leu Lys Glu Arg Gln Lys Met Leu His Ser Tyr Asp
225 230 235

<210> 57
<211> 128
<212> DNA
<213> Streptococcus agalactiae

<400> 57
atggataata aaggtaataa cgccaatgtg attgatgcaa tcgctgaggg tgcaagcaca 60
ggtgcacaaa tggctttctc aattggtgct agtttgattg cctttgttgg tttagtttct 120
ttgattaa 128

<210> 58
<211> 42
<212> PRT
<213> Streptococcus agalactiae

<400> 58
Met Asp Asn Lys Gly Asn Asn Ala Asn Val Ile Asp Ala Ile Ala Glu
1 5 10 15

Gly Ala Ser Thr Gly Ala Gln Met Ala Phe Ser Ile Gly Ala Ser Leu
20 25 30

Ile Ala Phe Val Gly Leu Val Ser Leu Ile
35 40

<210> 59
<211> 573
<212> DNA
<213> Streptococcus agalactiae

<400> 59
atgaaaaaga aaaacaaatc ctctaacatt gctataattg caatcttttt tgctattatg 60
cttgtcattc atttttgtc atcatttatt tttagttttt ggttagtccc tattaaacct 120
actttgatgc atatcccagt tattattgca tctatagcct atggacctcg tattggtgca 180
actctaggcg ccttaatggg ggggatcagc gtagctaaca gcagcattgt tctattacca 240
acgagttacc tcttctcacc ttttgttgaa aatggtaatt tttattcgct aattattgca 300
cttgtaccac gtattctaat cgggattatt ccttatttcg tttacaaatt actacacaac 360
cgctttggtt tggctatctc aggtgctata ggctctctaa caaacacagt atttgtttta 420
tctggaattt ttatcttttt ttcaagtact tataatggga atatcaagct aatgctcgct 480
gggattattt catctaattc attagctgag atggtcattg cagctatcat tgtatatcta 540
actgatcctc gtattctcaa tattaaacat taa 573

<210> 60
<211> 190
<212> PRT
<213> Streptococcus agalactiae

<400> 60
Met Lys Lys Lys Asn Lys Ser Ser Asn Ile Ala Ile Ile Ala Ile Phe
1 5 10 15

Phe Ala Ile Met Leu Val Ile His Phe Leu Ser Ser Phe Ile Phe Ser
20 25 30

Phe Trp Leu Val Pro Ile Lys Pro Thr Leu Met His Ile Pro Val Ile
35 40 45

Ile Ala Ser Ile Ala Tyr Gly Pro Arg Ile Gly Ala Thr Leu Gly Ala
50 55 60

Leu Met Gly Gly Ile Ser Val Ala Asn Ser Ser Ile Val Leu Leu Pro
65 70 75 80

Thr Ser Tyr Leu Phe Ser Pro Phe Val Glu Asn Gly Asn Phe Tyr Ser
85 90 95

Leu Ile Ile Ala Leu Val Pro Arg Ile Leu Ile Gly Ile Ile Pro Tyr
100 105 110

Phe Val Tyr Lys Leu Leu His Asn Arg Phe Gly Leu Ala Ile Ser Gly
115 120 125

Ala Ile Gly Ser Leu Thr Asn Thr Val Phe Val Leu Ser Gly Ile Phe
130 135 140

Ile Phe Phe Ser Ser Thr Tyr Asn Gly Asn Ile Lys Leu Met Leu Ala
145 150 155 160

Gly Ile Ile Ser Ser Asn Ser Leu Ala Glu Met Val Ile Ala Ala Ile
165 170 175

Ile Val Tyr Leu Thr Asp Pro Arg Ile Leu Asn Ile Lys His
180 185 190

<210> 61
<211> 251
<212> DNA
<213> Streptococcus agalactiae

<400> 61
ttgaatatga cattacaaga cgaaatcaaa aaacgccgta cttttgccat catctctcac 60

ccggatgctg gtaagacgac tattactgag caattattat attttggtgg tgaaattaga 120
gaagcaggga cagtaaaagg gaaaaaatca ggtacttttg caaagtccga ctggatggat 180
attgaaaagc aacggggtat ctctgttact tcatctgtta tgcaatttga ttacgcgggt 240
aaacgtgtta a 251

<210> 62
<211> 83
<212> PRT
<213> Streptococcus agalactiae

<400> 62
Met Asn Met Thr Leu Gln Asp Glu Ile Lys Lys Arg Arg Thr Phe Ala
1 5 10 15

Ile Ile Ser His Pro Asp Ala Gly Lys Thr Thr Ile Thr Glu Gln Leu
20 25 30

Leu Tyr Phe Gly Gly Glu Ile Arg Glu Ala Gly Thr Val Lys Gly Lys
35 40 45

Lys Ser Gly Thr Phe Ala Lys Ser Asp Trp Met Asp Ile Glu Lys Gln
50 55 60

Arg Gly Ile Ser Val Thr Ser Ser Val Met Gln Phe Asp Tyr Ala Gly
65 70 75 80

Lys Arg Val

<210> 63
<211> 303
<212> DNA
<213> Streptococcus agalactiae

<400> 63
atggcagata aaaacagaac atttaaactt gtaggtgcag gatcttctag cacacaagaa 60
aaaattgaaa agcctgctct ttcgtttatg caagatgcgt ggcgtcgctt gaaaaaaaac 120

aaattagcag tagtttcact ctatttatta gctcttttac ttacttttttc gttagcctca 180
aatttatttg taactcagaa ggatgctaat gggtttgatt cgaaaaaagt aacgacatat 240
cgcaacttac cacctaaatt gagttcaaac cttccttttt ggaatggtag cattaatcca 300
tca 303

<210> 64
<211> 101
<212> PRT
<213> Streptococcus agalactiae

<400> 64

Met Ala Asp Lys Asn Arg Thr Phe Lys Leu Val Gly Ala Gly Ser Ser
1 5 10 15

Ser Thr Gln Glu Lys Ile Glu Lys Pro Ala Leu Ser Phe Met Gln Asp
20 25 30

Ala Trp Arg Arg Leu Lys Lys Asn Lys Leu Ala Val Val Ser Leu Tyr
35 40 45

Leu Leu Ala Leu Leu Leu Thr Phe Ser Leu Ala Ser Asn Leu Phe Val
50 55 60

Thr Gln Lys Asp Ala Asn Gly Phe Asp Ser Lys Lys Val Thr Thr Tyr
65 70 75 80

Arg Asn Leu Pro Pro Lys Leu Ser Ser Asn Leu Pro Phe Trp Asn Gly
85 90 95

Ser Ile Asn Pro Ser
100

<210> 65
<211> 154
<212> DNA
<213> Streptococcus agalactiae

<400> 65
atgaaaagaa aacagtttat aaaattagga attgcaacct tactaacggt tatttcgctt 60
tacacaccaa taaacctagc tacaaatcat accacagaaa atattgttac tgctcaagag 120
tataaaacaa agagaatggt actttacctt ttaa 154

<210> 66
<211> 51
<212> PRT
<213> Streptococcus agalactiae

<400> 66
Met Lys Arg Lys Gln Phe Ile Lys Leu Gly Ile Ala Thr Leu Leu Thr
1 5 10 15

Val Ile Ser Leu Tyr Thr Pro Ile Asn Leu Ala Thr Asn His Thr Thr
20 25 30

Glu Asn Ile Val Thr Ala Gln Glu Tyr Lys Thr Lys Glu Asn Ile Leu
35 40 45

Phe Leu Leu
50

<210> 67
<211> 144
<212> DNA
<213> Streptococcus agalactiae

<400> 67
atgttttata atcctttact ttttattgta ctaattacaa ttgctgtatt tttcttagct 60

aagaaaaaat ggcaattacc gacatttact ttcattggtt tgctatttat ctataaccaa 120
gggctgtggg aacagttgat taat 144

<210> 68
<211> 48
<212> PRT
<213> Streptococcus agalactiae

<400> 68
Met Phe Tyr Asn Pro Leu Leu Phe Ile Val Leu Ile Thr Ile Ala Val
1 5 10 15

Phe Phe Leu Ala Lys Lys Lys Trp Gln Leu Pro Thr Phe Thr Phe Ile
20 25 30

Gly Leu Leu Phe Ile Tyr Asn Gln Gly Leu Trp Glu Gln Leu Ile Asn
35 40 45

<210> 69
<211> 453
<212> DNA
<213> Streptococcus agalactiae

<400> 69
gtggtgcaaa taatgaaaaa acatataaaa agtatcatac caatagttct tattggtatg 60
atactaggag gctgtcaaat gaatagtgaa cataaaagtc agtataatga aacaaaaagt 120
agcaagcaat cagaagtgaa gaaagataaa aaaatgacaa aaaaagaaca attagcttat 180
ctcaaagagc atgaacaaga aataattgat tttgtaaaat ctcagaataa aaagatagaa 240
tctgtacaaa ttgattggaa tgatgttcga tggagtaaag ggggaaatgg tacacctcaa 300
ggaggaggag aggggatttt acttttggg gagattaata atgattctga atcaagttgg 360
agagttgata ttgatataga aaaaggacgg ctagacctaa aaaatatgta tttaggacaa 420
cctatacgaa ttggaggtaa attatttgag taa 453

<210> 70
<211> 150
<212> PRT
<213> Streptococcus agalactiae

<400> 70

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Met Val Gln Ile Met Lys Lys His Ile Lys Ser Ile Ile Pro Ile Val
  1               5                  10                  15

Leu Ile Gly Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu His Lys
             20                  25                  30

Ser Gln Tyr Asn Glu Thr Lys Ser Ser Lys Gln Ser Glu Val Lys Lys
         35                  40                  45

Asp Lys Lys Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His
     50                  55                  60

Glu Gln Glu Ile Ile Asp Phe Val Lys Ser Gln Asn Lys Lys Ile Glu
 65                  70                  75                  80

Ser Val Gln Ile Asp Trp Asn Asp Val Arg Trp Ser Lys Gly Gly Asn
                 85                  90                  95

Gly Thr Pro Gln Gly Gly Gly Glu Gly Ile Leu Leu Phe Gly Glu Ile
            100                 105                 110

Asn Asn Asp Ser Glu Ser Ser Trp Arg Val Asp Ile Asp Ile Glu Lys
        115                 120                 125

Gly Arg Leu Asp Leu Lys Asn Met Tyr Leu Gly Gln Pro Ile Arg Ile
    130                 135                 140

Gly Gly Lys Leu Phe Glu
145                 150
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<210> 71
<211> 1455
<212> DNA
<213> Streptococcus agalactiae

<400> 71
atggaatttt tggcttataa tgctttcaca gcaatcggtg tttctattcc gcacggtaat 60
catttccact ttattcacta taaggatatg tctccattag agttagaagc aacaaggatg 120
gtggcagagc atagaggaca tcatattgat gcattaggga aaaaagattc tacagagaaa 180
ccaaagcata tttctcatga acctaataag gaacctcaca cagaggaaga acaccatgca 240
gtaacaccga aagaccaacg taaaggcaaa ccaaatagcc agattgtcta cagtgctcaa 300
gaaattgaag aggcaaaaaa agctggtaaa tacacaacat ctgatggtta catttttgat 360
gctaaagata ttaaaaaaga tacaggtaca ggttatgtca ttccacatat gacacatgag 420
cattgggtac caaagaaaga tttatcagag tcggaattaa aagcagctca agaatttctt 480
tcaggaaaat ctgaagcaaa tcaagacaaa ccaaaaacag gtaaaacagc tcaagaaatc 540
tatgaggcaa ttgaaccaaa agcaattgtt aaacctgaag atttattatt tggaattgca 600
caagcgacag actataagaa tggtacattt gtaattcctc ataaagatca ttaccattat 660
gtggaattaa aatggtttga tgaagaaaaa gatcttttag ctgattcaga taagacatat 720
tctttagaag actatttagc tacggctaaa tattacatga tgcacccaga aaaacgtcct 780
aaagttgaag gatggggtaa agatgctgaa atttataagg aaaaggactc taataaagca 840
gataaaccaa gtcctgcacc aactgataat aaatcaacat caaattctag tgacaaaaac 900
ttaagtgctg cagaagtatt caaacaagca aaaccagaaa aaattgtacc gcttgataaa 960
attgctgctc acatggcata tgcagttgga tttgaagatg atcaattgat tgttcctcat 1020
catgatcatt atcataatgt tcctatggca tggtttgaca agggtggttt atggaaagca 1080
ccagaaggct atacattaca acaactcttc tcaacaatta aatactacat ggaacatcct 1140
aatgaattac caaaagaaaa gggttgggga cacgacagtg atcataacaa aggctcaaat 1200
aaagacaata aagccaaaaa ttatgctcca gatgaagaac ctgaagattc agggaaagta 1260
actcacaact atggttttta tgatgttaat aaaggttcag acgaagaaga accagaaaaa 1320
caagaagatg aatcagagct agatgaatat gaactaggaa tggcacaaaa cgctaagaaa 1380
tatggtatgg atagacaatc ttttgaaaag caactcatcc aattatcaaa taaatatagt 1440
gtaagttttg aaagc 1455

<210> 72
<211> 485
<212> PRT
<213> Streptococcus agalactiae

<400> 72

Met Glu Phe Leu Ala Tyr Asn Ala Phe Thr Ala Ile Gly Val Ser Ile
1 5 10 15

Pro His Gly Asn His Phe His Phe Ile His Tyr Lys Asp Met Ser Pro
20 25 30

Leu Glu Leu Glu Ala Thr Arg Met Val Ala Glu His Arg Gly His His
35 40 45

Ile Asp Ala Leu Gly Lys Lys Asp Ser Thr Glu Lys Pro Lys His Ile
50 55 60

Ser His Glu Pro Asn Lys Glu Pro His Thr Glu Glu Glu His His Ala
65 70 75 80

Val Thr Pro Lys Asp Gln Arg Lys Gly Lys Pro Asn Ser Gln Ile Val
85 90 95

Tyr Ser Ala Gln Glu Ile Glu Glu Ala Lys Lys Ala Gly Lys Tyr Thr
100 105 110

Thr Ser Asp Gly Tyr Ile Phe Asp Ala Lys Asp Ile Lys Lys Asp Thr
115 120 125

Gly Thr Gly Tyr Val Ile Pro His Met Thr His Glu His Trp Val Pro
130 135 140

Lys Lys Asp Leu Ser Glu Ser Glu Leu Lys Ala Ala Gln Glu Phe Leu
145 150 155 160

Ser Gly Lys Ser Glu Ala Asn Gln Asp Lys Pro Lys Thr Gly Lys Thr
165 170 175

Ala Gln Glu Ile Tyr Glu Ala Ile Glu Pro Lys Ala Ile Val Lys Pro
180 185 190

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Glu Asp Leu Leu Phe Gly Ile Ala Gln Ala Thr Asp Tyr Lys Asn Gly
        195                 200                 205

Thr Phe Val Ile Pro His Lys Asp His Tyr His Tyr Val Glu Leu Lys
    210                 215                 220

Trp Phe Asp Glu Glu Lys Asp Leu Leu Ala Asp Ser Asp Lys Thr Tyr
225                 230                 235                 240

Ser Leu Glu Asp Tyr Leu Ala Thr Ala Lys Tyr Tyr Met Met His Pro
                245                 250                 255

Glu Lys Arg Pro Lys Val Glu Gly Trp Gly Lys Asp Ala Glu Ile Tyr
            260                 265                 270

Lys Glu Lys Asp Ser Asn Lys Ala Asp Lys Pro Ser Pro Ala Pro Thr
        275                 280                 285

Asp Asn Lys Ser Thr Ser Asn Ser Ser Asp Lys Asn Leu Ser Ala Ala
    290                 295                 300

Glu Val Phe Lys Gln Ala Lys Pro Glu Lys Ile Val Pro Leu Asp Lys
305                 310                 315                 320

Ile Ala Ala His Met Ala Tyr Ala Val Gly Phe Glu Asp Asp Gln Leu
                325                 330                 335

Ile Val Pro His His Asp His Tyr His Asn Val Pro Met Ala Trp Phe
            340                 345                 350

Asp Lys Gly Gly Leu Trp Lys Ala Pro Glu Gly Tyr Thr Leu Gln Gln
        355                 360                 365

Leu Phe Ser Thr Ile Lys Tyr Tyr Met Glu His Pro Asn Glu Leu Pro
    370                 375                 380

Lys Glu Lys Gly Trp Gly His Asp Ser Asp His Asn Lys Gly Ser Asn
385                 390                 395                 400
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Lys Asp Asn Lys Ala Lys Asn Tyr Ala Pro Asp Glu Glu Pro Glu Asp
405 410 415

Ser Gly Lys Val Thr His Asn Tyr Gly Phe Tyr Asp Val Asn Lys Gly
420 425 430

Ser Asp Glu Glu Glu Pro Glu Lys Gln Glu Asp Glu Ser Glu Leu Asp
435 440 445

Glu Tyr Glu Leu Gly Met Ala Gln Asn Ala Lys Lys Tyr Gly Met Asp
450 455 460

Arg Gln Ser Phe Glu Lys Gln Leu Ile Gln Leu Ser Asn Lys Tyr Ser
465 470 475 480

Val Ser Phe Glu Ser
485

<210> 73
<211> 855
<212> DNA
<213> Streptococcus agalactiae

<400> 73
atgaggaaac gtttttcctt gctaaatttt attgttgtta cttttatttt ctttttcttt 60
attctttttc cgctttttaa ggccaaagat tgtcaggttg tttatgcaag ttttcaagga 120
gatcattggg acatttgtaa cgcatttgat tttccgtatt tacatcgctt tgatctcatt 180
aaaggtaaag aaaatcaact ttactttata ggttgtacaa ttgctaacag taaagcctac 240
actgaggatt ggagtgataa aggccgaatt tttgttgctc gttttaatac tcaaaaccat 300
acattggaag gattgcaaca attgcctcaa actttattaa aaaatcatgg atactatgcc 360
attcaggatg aaggatattc attgattact tcagtagaag gggtactcaa actcacttat 420
ccagaatttt ctactacagg cgactggcaa ttagaacggc ttttcgatga ggagacaagc 480
gatgtggtga aagtggatat taatcaggat ggtaaggatg agtatgtgat catccaaggt 540
tttcatggag atcgtttacg tatcttcact gaagatttcg gtcgagaatt attccattat 600
cctgaaaaaa ccccatttgg tcacgctatt tggagtggtc gtttacttaa tcagacttgt 660
ttcgtattcg ggtggcgatc agaaaaagca gaattaaggc tttttcactt tgtagatggg 720

cacttggttt cagaattagt agatgcaaaa gcagcttcta gtaatgtctt agcttttgaa 780
aaagatggaa aagcttatct tttctcagcc aataacggac gtggcgaagt tgctctttat 840
caattagtaa aataa 855

<210> 74
<211> 284
<212> PRT
<213> Streptococcus agalactiae

<400> 74

Met Arg Lys Arg Phe Ser Leu Leu Asn Phe Ile Val Val Thr Phe Ile
1 5 10 15

Phe Phe Phe Phe Ile Leu Phe Pro Leu Phe Lys Ala Lys Asp Cys Gln
20 25 30

Val Val Tyr Ala Ser Phe Gln Gly Asp His Trp Asp Ile Cys Asn Ala
35 40 45

Phe Asp Phe Pro Tyr Leu His Arg Phe Asp Leu Ile Lys Gly Lys Glu
50 55 60

Asn Gln Leu Tyr Phe Ile Gly Cys Thr Ile Ala Asn Ser Lys Ala Tyr
65 70 75 80

Thr Glu Asp Trp Ser Asp Lys Gly Arg Ile Phe Val Ala Arg Phe Asn
85 90 95

Thr Gln Asn His Thr Leu Glu Gly Leu Gln Gln Leu Pro Gln Thr Leu
100 105 110

Leu Lys Asn His Gly Tyr Tyr Ala Ile Gln Asp Glu Gly Tyr Ser Leu
115 120 125

Ile Thr Ser Val Glu Gly Val Leu Lys Leu Thr Tyr Pro Glu Phe Ser
130 135 140

Thr Thr Gly Asp Trp Gln Leu Glu Arg Leu Phe Asp Glu Glu Thr Ser
145 150 155 160

Asp Val Val Lys Val Asp Ile Asn Gln Asp Gly Lys Asp Glu Tyr Val
165 170 175

Ile Ile Gln Gly Phe His Gly Asp Arg Leu Arg Ile Phe Thr Glu Asp
180 185 190

Phe Gly Arg Glu Leu Phe His Tyr Pro Glu Lys Thr Pro Phe Gly His
195 200 205

Ala Ile Trp Ser Gly Arg Leu Leu Asn Gln Thr Cys Phe Val Phe Gly
210 215 220

Trp Arg Ser Glu Lys Ala Glu Leu Arg Leu Phe His Phe Val Asp Gly
225 230 235 240

His Leu Val Ser Glu Leu Val Asp Ala Lys Ala Ala Ser Ser Asn Val
245 250 255

Leu Ala Phe Glu Lys Asp Gly Lys Ala Tyr Leu Phe Ser Ala Asn Asn
260 265 270

Gly Arg Gly Glu Val Ala Leu Tyr Gln Leu Val Lys
275 280

<210> 75
<211> 2070
<212> DNA
<213> Streptococcus agalactiae

<400> 75
atgaagcaca agttaaaagc ttttacgctt gctttactct caatattctt tgtgtttggt 60
ggaaaggtca gtgcagagac tgtgaatatt gtttctgata cagcatacgc tccattcgaa 120
tttaaagatt ctgatcaaac ttataaagga atcgatgttg acatcgttaa cgaagtcgct 180

aagcgtgctg gctggaatgt taacatgacg tatccaggtt ttgatgccgc agttaacgct 240
gttcaatctg gacaggcaga tgcgctaatg gccggaacta ctgttactga agcacgtaaa 300
aaagtcttta atttctcaga tacttattac gatacttccg ttattcttta tactaaaaat 360
aataataaag tcacaaacta caaacaacta aaaggaaaag tagtcggtgt aaaaaatgga 420
acagctgctc aaagcttctt agaagaaaat aaatctaaat acggctataa agttaaaaca 480
tttgatacaa gcgacctaat gaataacagc cttgattctg gttctattta cgccgctatg 540
gacgatcaac cagttgtgca atttgcgata aatcaaggaa aagcttacgc cattaacatg 600
gaaggcgaag cagttggtag ctttgcattt gctgtcaaaa aaggtagtgg acacgataat 660
ctaattaaag aatttaacac agcttttgca caaatgaaat cagatggcac ttataatgac 720
atcatggata aatggcttgg aaaagacgct acaaaaacaa gcggcaaagc aacaggtaat 780
gccaatgaaa aagcaactcc tgtaaagcca agttataaaa ttgtttctga ttcttcattc 840
gcaccattcg aatatcaaaa cggtaaaggg aaatatactg gttttgatat ggaattaatc 900
acgaaaattg ctaaacagca aggttttaaa cttgatatct caaatccagg ttttgatgcc 960
gctttaaatg ctgtccaatc tgggcaagct gacggtgtta ttgcaggagc cacaatcaca 1020
gaagcacgcc aaaaaatctt tgatttttct gatccttatt acacatctag cgttatctta 1080
gcggttaaaa aaggaagcaa tgtcaaatca taccaagatt taaaaggaaa aacagttggt 1140
gctaaaaatg gtactgcctc atatacttgg ttatcagacc acgcagataa gtacaactat 1200
catgttaaag catttgatga agcatctaca atgtatgata gtatgaactc aggttcaatt 1260
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gaaacaccta tcaaaggtga aaaatcaggc gatatcggat ttgcagtgaa aaaagggaca 1380
aatccagaat taattaaaat gtttaacaac ggtcttgctt cactcaaaaa atcgggtgag 1440
tacgataaac ttgttaaaaa atacctttcc acagccagca cttcttcaaa cgataaagct 1500
gctaaacctg tagatgaatc aactatttta gggttaattt ctaataacta caaacaattg 1560
ctatctggta ttggaactac tttaagttta actcttatct cgtttgcgat tgctatggtt 1620
attggtatta tctttggtat gatgagcgta tcaccaagta atactctccg cacaatttca 1680
atgatttttg ttgatattgt ccgtggtatt ccactcatga ttgtggccgc ttttattttc 1740
tggggtattc ctaatttaat cgaaagcatc acaggtcacc aaagtccaat taatgacttc 1800
gttgctgcta ctatcgctct ttctttaaat ggtggtgcgt acattgctga aattgtacgt 1860
ggtggtattg aagctgttcc ttctggtcaa atggaagcaa gtcgcagctt aggtatttct 1920
tacggcaaaa ctatgcaaaa ggttatctta cctcaagcag tacgccttat gttaccaaac 1980
tttatcaacc aatttgtcat ctcattaaag gatacaacaa ttgtatcagc aatcggactt 2040
gtggaactct tccaaactgg taaatcataa 2070

<210> 76
<211> 689
<212> PRT
<213> Streptococcus agalactiae

<400> 76

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Met Lys His Lys Leu Lys Ala Phe Thr Leu Ala Leu Leu Ser Ile Phe
  1               5                  10                  15

Phe Val Phe Gly Gly Lys Val Ser Ala Glu Thr Val Asn Ile Val Ser
             20                  25                  30

Asp Thr Ala Tyr Ala Pro Phe Glu Phe Lys Asp Ser Asp Gln Thr Tyr
         35                  40                  45

Lys Gly Ile Asp Val Asp Ile Val Asn Glu Val Ala Lys Arg Ala Gly
     50                  55                  60

Trp Asn Val Asn Met Thr Tyr Pro Gly Phe Asp Ala Ala Val Asn Ala
 65                  70                  75                  80

Val Gln Ser Gly Gln Ala Asp Ala Leu Met Ala Gly Thr Thr Val Thr
                 85                  90                  95

Glu Ala Arg Lys Lys Val Phe Asn Phe Ser Asp Thr Tyr Tyr Asp Thr
            100                 105                 110

Ser Val Ile Leu Tyr Thr Lys Asn Asn Asn Lys Val Thr Asn Tyr Lys
        115                 120                 125

Gln Leu Lys Gly Lys Val Val Gly Val Lys Asn Gly Thr Ala Ala Gln
    130                 135                 140

Ser Phe Leu Glu Glu Asn Lys Ser Lys Tyr Gly Tyr Lys Val Lys Thr
145                 150                 155                 160

Phe Asp Thr Ser Asp Leu Met Asn Asn Ser Leu Asp Ser Gly Ser Ile
                165                 170                 175

Tyr Ala Ala Met Asp Asp Gln Pro Val Val Gln Phe Ala Ile Asn Gln
            180                 185                 190
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Gly Lys Ala Tyr Ala Ile Asn Met Glu Gly Glu Ala Val Gly Ser Phe
        195                 200                 205

Ala Phe Ala Val Lys Lys Gly Ser Gly His Asp Asn Leu Ile Lys Glu
    210                 215                 220

Phe Asn Thr Ala Phe Ala Gln Met Lys Ser Asp Gly Thr Tyr Asn Asp
225                 230                 235                 240

Ile Met Asp Lys Trp Leu Gly Lys Asp Ala Thr Lys Thr Ser Gly Lys
                245                 250                 255

Ala Thr Gly Asn Ala Asn Glu Lys Ala Thr Pro Val Lys Pro Ser Tyr
            260                 265                 270

Lys Ile Val Ser Asp Ser Ser Phe Ala Pro Phe Glu Tyr Gln Asn Gly
        275                 280                 285

Lys Gly Lys Tyr Thr Gly Phe Asp Met Glu Leu Ile Thr Lys Ile Ala
    290                 295                 300

Lys Gln Gln Gly Phe Lys Leu Asp Ile Ser Asn Pro Gly Phe Asp Ala
305                 310                 315                 320

Ala Leu Asn Ala Val Gln Ser Gly Gln Ala Asp Gly Val Ile Ala Gly
                325                 330                 335

Ala Thr Ile Thr Glu Ala Arg Gln Lys Ile Phe Asp Phe Ser Asp Pro
            340                 345                 350

Tyr Tyr Thr Ser Ser Val Ile Leu Ala Val Lys Lys Gly Ser Asn Val
        355                 360                 365

Lys Ser Tyr Gln Asp Leu Lys Gly Lys Thr Val Gly Ala Lys Asn Gly
    370                 375                 380

Thr Ala Ser Tyr Thr Trp Leu Ser Asp His Ala Asp Lys Tyr Asn Tyr
385                 390                 395                 400
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His Val Lys Ala Phe Asp Glu Ala Ser Thr Met Tyr Asp Ser Met Asn
405 410 415

Ser Gly Ser Ile Asp Ala Leu Met Asp Asp Glu Ala Val Leu Ala Tyr
420 425 430

Ala Ile Asn Gln Gly Arg Lys Phe Glu Thr Pro Ile Lys Gly Glu Lys
435 440 445

Ser Gly Asp Ile Gly Phe Ala Val Lys Lys Gly Ala Asn Pro Glu Leu
450 455 460

Ile Lys Met Phe Asn Asn Gly Leu Ala Ser Leu Lys Lys Ser Gly Glu
465 470 475 480

Tyr Asp Lys Leu Val Lys Lys Tyr Leu Ser Thr Ala Ser Thr Ser Ser
485 490 495

Asn Asp Lys Ala Ala Lys Pro Val Asp Glu Ser Thr Ile Leu Gly Leu
500 505 510

Ile Ser Asn Asn Tyr Lys Gln Leu Leu Ser Gly Ile Gly Thr Thr Leu
515 520 525

Ser Leu Thr Leu Ile Ser Phe Ala Ile Ala Met Val Ile Gly Ile Ile
530 535 540

Phe Gly Met Met Ser Val Ser Pro Ser Asn Thr Leu Arg Thr Ile Ser
545 550 555 560

Met Ile Phe Val Asp Ile Val Arg Gly Ile Pro Leu Met Ile Val Ala
565 570 575

Ala Phe Ile Phe Trp Gly Ile Pro Asn Leu Ile Glu Ser Ile Thr Gly
580 585 590

His Gln Ser Pro Ile Asn Asp Phe Val Ala Ala Thr Ile Ala Leu Ser
595 600 605

Leu Asn Gly Gly Ala Tyr Ile Ala Glu Ile Val Arg Gly Gly Ile Glu
610 615 620

Ala Val Pro Ser Gly Gln Met Glu Ala Ser Arg Ser Leu Gly Ile Ser
625 630 635 640

Tyr Gly Lys Thr Met Gln Lys Val Ile Leu Pro Gln Ala Val Arg Leu
645 650 655

Met Leu Pro Asn Phe Ile Asn Gln Phe Val Ile Ser Leu Lys Asp Thr
660 665 670

Thr Ile Val Ser Ala Ile Gly Leu Val Glu Leu Phe Gln Thr Gly Lys
675 680 685

Ser

<210> 77
<211> 149
<212> DNA
<213> Streptococcus agalactiae

<400> 77
ttggaaggtt tacttattgc attgattccc atgtttgcgt ggggaagtat tggatttgtt 60
agtaataaaa ttggagggcg tccaaatcaa caaacatttg gaatgacttt aggagcattg 120
ctatttgcga ttatcgtatg tttatttaa 149

<210> 78
<211> 49
<212> PRT
<213> Streptococcus agalactiae

<400> 78
Met Glu Gly Leu Leu Ile Ala Leu Ile Pro Met Phe Ala Trp Gly Ser
1 5 10 15

Ile Gly Phe Val Ser Asn Lys Ile Gly Gly Arg Pro Asn Gln Gln Thr
20 25 30

Phe Gly Met Thr Leu Gly Ala Leu Leu Phe Ala Ile Ile Val Cys Leu
35 40 45

Phe

<210> 79
<211> 963
<212> DNA
<213> Streptococcus agalactiae

<400> 79
atgaatacta tttataatac attgagaaca gataaaggtt ataaagttta tgaggggtat 60
ttatatgaaa ttactggtga agaatgtgaa gaagccttag accttgtgat tcctaagaat 120
attgtatttg cagatacaga tacttgtggc tacacttttt tactcaatga agatggaaca 180
gtttatgatg atgtgacttt ctacaaattt gatgataaat attggttggc tagtcataaa 240
gctttggatt cttatttaga caacatcaat tttgactata ccgtaacaga tatttctgac 300
gagtataaaa tgctgcaaat tgaaggaaga tattcgggag aaattgctca gtcattttat 360
gaatatgata tttcaacact taatttttcgt actcttcgca tagagatgga cttcatcaaa 420
ggtgaggaaa ggttatcttg gcgtagattt ggtttttctg gagaatttgg ctatcaattt 480
ttcctaccat cttctatttt tgctactttt gtttcggatg tctgtgaagg tatagcagag 540
tgtggggatg aacttgatag atatttaagg tttgaagtgg gacaacccat tactgatatt 600
tatcaacaag aagaatattc tttatatgaa ataggttatt cttggaatct agatttcaca 660
aaggaagaat ttagaggtcg cgatagcttg ttagagcaca tcagatcagc aacagttaaa 720
agtgttggat tctcaacgaa ggaaaaactc gcttcaggaa caccagtgct atttgatgac 780
caaattgttg gaaagatttt ttggatagca gacgagaaac actcttcgga aaattaccta 840
ggtttgatga ttgttaacca aacatatgct cattcaggag ttacttttgt aacagaagat 900
ggccaaattt tgaaaacaca atcaagccct tattgtatcc cagaaagttg gaacaaagaa 960
tga 963

<210> 80
<211> 320
<212> PRT
<213> Streptococcus agalactiae

<400> 80

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Met Asn Thr Ile Tyr Asn Thr Leu Arg Thr Asp Lys Gly Tyr Lys Val
 1               5                  10                  15

Tyr Glu Gly Tyr Leu Tyr Glu Ile Thr Gly Glu Glu Cys Glu Glu Ala
            20                  25                  30

Leu Asp Leu Val Ile Pro Lys Asn Ile Val Phe Ala Asp Thr Asp Thr
        35                  40                  45

Cys Gly Tyr Thr Phe Leu Leu Asn Glu Asp Gly Thr Val Tyr Asp Asp
    50                  55                  60

Val Thr Phe Tyr Lys Phe Asp Asp Lys Tyr Trp Leu Ala Ser His Lys
65                  70                  75                  80

Ala Leu Asp Ser Tyr Leu Asp Asn Ile Asn Phe Asp Tyr Thr Val Thr
                85                  90                  95

Asp Ile Ser Asp Glu Tyr Lys Met Leu Gln Ile Glu Gly Arg Tyr Ser
            100                 105                 110

Gly Glu Ile Ala Gln Ser Phe Tyr Glu Tyr Asp Ile Ser Thr Leu Asn
        115                 120                 125

Phe Arg Thr Leu Arg Ile Glu Met Asp Phe Ile Lys Gly Glu Glu Arg
    130                 135                 140

Leu Ser Trp Arg Arg Phe Gly Phe Ser Gly Glu Phe Gly Tyr Gln Phe
145                 150                 155                 160

Phe Leu Pro Ser Ser Ile Phe Ala Thr Phe Val Ser Asp Val Cys Glu
                165                 170                 175
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Gly Ile Ala Glu Cys Gly Asp Glu Leu Asp Arg Tyr Leu Arg Phe Glu
180 185 190

Val Gly Gln Pro Ile Thr Asp Ile Tyr Gln Gln Glu Glu Tyr Ser Leu
195 200 205

Tyr Glu Ile Gly Tyr Ser Trp Asn Leu Asp Phe Thr Lys Glu Glu Phe
210 215 220

Arg Gly Arg Asp Ser Leu Leu Glu His Ile Arg Ser Ala Thr Val Lys
225 230 235 240

Ser Val Gly Phe Ser Thr Lys Glu Lys Leu Ala Ser Gly Thr Pro Val
245 250 255

Leu Phe Asp Asp Gln Ile Val Gly Lys Ile Phe Trp Ile Ala Asp Glu
260 265 270

Lys His Ser Ser Glu Asn Tyr Leu Gly Leu Met Ile Val Asn Gln Thr
275 280 285

Tyr Ala His Ser Gly Val Thr Phe Val Thr Glu Asp Gly Gln Ile Leu
290 295 300

Lys Thr Gln Ser Ser Pro Tyr Cys Ile Pro Glu Ser Trp Asn Lys Glu
305 310 315 320

<210> 81
<211> 702
<212> DNA
<213> Streptococcus agalactiae

<400> 81
atggagttag taattagaga tattcgtaag cggtttcagg aaacagaggt cttgagagga 60
gcaagttacc gattttattc aggtaaaata acaggggtct taggtaggaa tggtgctggg 120
aaaacaactt tatttaatat actttatggg gatcttgcag ctgacaacgg gaccatttgt 180
ttattgaagg ataatcacga gtatcctctt accgataagg atattggtat tgtttattcc 240

gaaaactacc ttccagaatt tttaacaggg tatgaatttg taaaatttta catggattta 300
catccttcag atgatttaat gacaatagat gattatttag attttatgga aataggacaa 360
acagagcgtc atagaattat caaaggatat tctgatggaa tgaagagtaa gctctcatta 420
atttgcctga tgatttctaa gccaaaagta attttactag atgagccact gactgcagtt 480
gatgttgtat caagtattgc aataaaacgc cttttgttgg aattaagtga ggatcatatt 540
attatattat caactcatat aatggcctta gcagaagatc tatgtgatat tgtggctgta 600
ttagacaaag gaaaactcca aacattagat attgatcgta aacatgaaca attcgaagag 660
cgtcttcttc aagtgttgaa gggagatgaa tatgacaagt aa 702

<210> 82
<211> 233
<212> PRT
<213> Streptococcus agalactiae

<400> 82
Met Glu Leu Val Ile Arg Asp Ile Arg Lys Arg Phe Gln Glu Thr Glu
1 5 10 15

Val Leu Arg Gly Ala Ser Tyr Arg Phe Tyr Ser Gly Lys Ile Thr Gly
20 25 30

Val Leu Gly Arg Asn Gly Ala Gly Lys Thr Thr Leu Phe Asn Ile Leu
35 40 45

Tyr Gly Asp Leu Ala Ala Asp Asn Gly Thr Ile Cys Leu Leu Lys Asp
50 55 60

Asn His Glu Tyr Pro Leu Thr Asp Lys Asp Ile Gly Ile Val Tyr Ser
65 70 75 80

Glu Asn Tyr Leu Pro Glu Phe Leu Thr Gly Tyr Glu Phe Val Lys Phe
85 90 95

Tyr Met Asp Leu His Pro Ser Asp Asp Leu Met Thr Ile Asp Asp Tyr
100 105 110

Leu Asp Phe Met Glu Ile Gly Gln Thr Glu Arg His Arg Ile Ile Lys
115 120 125

Gly Tyr Ser Asp Gly Met Lys Ser Lys Leu Ser Leu Ile Cys Leu Met
130 135 140

Ile Ser Lys Pro Lys Val Ile Leu Leu Asp Glu Pro Leu Thr Ala Val
145 150 155 160

Asp Val Val Ser Ser Ile Ala Ile Lys Arg Leu Leu Leu Glu Leu Ser
165 170 175

Glu Asp His Ile Ile Ile Leu Ser Thr His Ile Met Ala Leu Ala Glu
180 185 190

Asp Leu Cys Asp Ile Val Ala Val Leu Asp Lys Gly Lys Leu Gln Thr
195 200 205

Leu Asp Ile Asp Arg Lys His Glu Gln Phe Glu Glu Arg Leu Leu Gln
210 215 220

Val Leu Lys Gly Asp Glu Tyr Asp Lys
225 230

<210> 83
<211> 774
<212> DNA
<213> Streptococcus agalactiae

<400> 83
ttgtttatga gatatacaaa tggaaatttt gaagcctttg caagacctcg aaaacctgaa 60
ggtgtggata aaaaatccgc ttatattgtt ggttctggtt tagcaggatt agctgccgct 120
gtctttttaa tacgtgacgg tcaaatggat ggtcaacgta ttcatatttt tgaagaacta 180
cctctttctg gaggatcact tgacggtgtc aaacgacctg atatcggttt tgtaacgcgt 240
ggtggtcgtg aaatggaaaa tcacttcgaa tgtatgtggg atatgtaccg ttccatcccc 300
tctctcgaag ttccagatgc ttcttatcta gatgaatttt attggcttga caaggatgat 360

cccaattcat ctaactgtcg cctcattcat aaacagggga atcgcttaga atctgatggt 420
gattttacac tcggaacaca ttccaaagag ttagttaagc tagtcatgga gactgaagag 480
tctttaggtg ctaagacgat tgaagaagtt ttttcaaaag aatttttga aagtaatttt 540
tggacttatt gggctactat gtttgccttt gagaaatggc attcagcgat tgaaatgcgt 600
cgatatgcta tgcgctttat ccatcatatt ggtggtctgc ctgatttcac ttcattaaaa 660
tttaataaat ataatcaata tgattctatg gtgaaaccaa tcatcagtta tttagagtct 720
cataatgtag atgttcaatt tgatagcaag gtaactaata tctccgtaga cttt 774

<210> 84
<211> 258
<212> PRT
<213> Streptococcus agalactiae

<400> 84
Met Phe Met Arg Tyr Thr Asn Gly Asn Phe Glu Ala Phe Ala Arg Pro
1 5 10 15

Arg Lys Pro Glu Gly Val Asp Lys Lys Ser Ala Tyr Ile Val Gly Ser
20 25 30

Gly Leu Ala Gly Leu Ala Ala Ala Val Phe Leu Ile Arg Asp Gly Gln
35 40 45

Met Asp Gly Gln Arg Ile His Ile Phe Glu Glu Leu Pro Leu Ser Gly
50 55 60

Gly Ser Leu Asp Gly Val Lys Arg Pro Asp Ile Gly Phe Val Thr Arg
65 70 75 80

Gly Gly Arg Glu Met Glu Asn His Phe Glu Cys Met Trp Asp Met Tyr
85 90 95

Arg Ser Ile Pro Ser Leu Glu Val Pro Asp Ala Ser Tyr Leu Asp Glu
100 105 110

Phe Tyr Trp Leu Asp Lys Asp Asp Pro Asn Ser Ser Asn Cys Arg Leu
115 120 125

Ile His Lys Gln Gly Asn Arg Leu Glu Ser Asp Gly Asp Phe Thr Leu
130 135 140

Gly Thr His Ser Lys Glu Leu Val Lys Leu Val Met Glu Thr Glu Glu
145 150 155 160

Ser Leu Gly Ala Lys Thr Ile Glu Glu Val Phe Ser Lys Glu Phe Phe
165 170 175

Glu Ser Asn Phe Trp Thr Tyr Trp Ala Thr Met Phe Ala Phe Glu Lys
180 185 190

Trp His Ser Ala Ile Glu Met Arg Arg Tyr Ala Met Arg Phe Ile His
195 200 205

His Ile Gly Gly Leu Pro Asp Phe Thr Ser Leu Lys Phe Asn Lys Tyr
210 215 220

Asn Gln Tyr Asp Ser Met Val Lys Pro Ile Ile Ser Tyr Leu Glu Ser
225 230 235 240

His Asn Val Asp Val Gln Phe Asp Ser Lys Val Thr Asn Ile Ser Val
245 250 255

Asp Phe

<210> 85
<211> 903
<212> DNA
<213> Streptococcus agalactiae

<400> 85
ttgttggctt ctttatttat cgtccgtttg tcaaaatcgc tttcgctaag gaggagcaat 60
atgaaaaaat tacttagatg gcttcctcct gtacttttca ttattatcct tataggaatg 120
actatcttag gtaagtccta tatcaataaa gtaacagctc acaaaataaa actctataac 180

tctcgaatga ctcctactat tttaatttca ggatccagtg ctactcaaga acgatttaac 240
agcatgttag cacagctcaa ccaaatggga gaaaaacata gcgttttaaa gttaactgtc 300
aaaaaagaca atagcattat ctacaatgga caaattagcg gcaatgacca caaaccctac 360
attgtcattg gatttgaaaa taatgaagat ggttatagta acatcaaaaa acaaacaaaa 420
tggctacaga ttgctatgaa tgatcttcag aagaaatata aatttaaacg ttttaacgct 480
atcggtcatt caaatggtgg cttatcatgg actattttcc tagaagatta ttacgactct 540
gatgaatttg atatgaaatc attgttaaca atgggaacac cttttaactt tgaagaaagt 600
aacacctcaa atcatactca aatgcttaaa gatttaatca gtaataaagg aaatattcca 660
tcaagtctca tggtatacaa tttggcagga actaattcat atgatggtga taaaattgtt 720
ccatttgcta gtgtggagac tggtaaatat attttccaag aaaccgctaa acactatacc 780
caactaacag taactggtaa taatgctaca cattctgact tgcctgataa tcctgaagtt 840
atccaatatg tcgcagaaaa aattcttaaa aatgagaaag gtaaattacc aaaacctcac 900
taa 903

<210> 86
<211> 300
<212> PRT
<213> Streptococcus agalactiae

<400> 86
Met Leu Ala Ser Leu Phe Ile Val Arg Leu Ser Lys Ser Leu Ser Leu
1 5 10 15

Arg Arg Ser Asn Met Lys Lys Leu Leu Arg Trp Leu Pro Pro Val Leu
20 25 30

Phe Ile Ile Ile Leu Ile Gly Met Thr Ile Leu Gly Lys Ser Tyr Ile
35 40 45

Asn Lys Val Thr Ala His Lys Ile Lys Leu Tyr Asn Ser Arg Met Thr
50 55 60

Pro Thr Ile Leu Ile Ser Gly Ser Ser Ala Thr Gln Glu Arg Phe Asn
65 70 75 80

Ser Met Leu Ala Gln Leu Asn Gln Met Gly Glu Lys His Ser Val Leu
85 90 95

Lys Leu Thr Val Lys Lys Asp Asn Ser Ile Ile Tyr Asn Gly Gln Ile
100 105 110

Ser Gly Asn Asp His Lys Pro Tyr Ile Val Ile Gly Phe Glu Asn Asn
115 120 125

Glu Asp Gly Tyr Ser Asn Ile Lys Lys Gln Thr Lys Trp Leu Gln Ile
130 135 140

Ala Met Asn Asp Leu Gln Lys Lys Tyr Lys Phe Lys Arg Phe Asn Ala
145 150 155 160

Ile Gly His Ser Asn Gly Gly Leu Ser Trp Thr Ile Phe Leu Glu Asp
165 170 175

Tyr Tyr Asp Ser Asp Glu Phe Asp Met Lys Ser Leu Leu Thr Met Gly
180 185 190

Thr Pro Phe Asn Phe Glu Glu Ser Asn Thr Ser Asn His Thr Gln Met
195 200 205

Leu Lys Asp Leu Ile Ser Asn Lys Gly Asn Ile Pro Ser Ser Leu Met
210 215 220

Val Tyr Asn Leu Ala Gly Thr Asn Ser Tyr Asp Gly Asp Lys Ile Val
225 230 235 240

Pro Phe Ala Ser Val Glu Thr Gly Lys Tyr Ile Phe Gln Glu Thr Ala
245 250 255

Lys His Tyr Thr Gln Leu Thr Val Thr Gly Asn Asn Ala Thr His Ser
260 265 270

Asp Leu Pro Asp Asn Pro Glu Val Ile Gln Tyr Val Ala Glu Lys Ile
275 280 285

Leu Lys Asn Glu Lys Gly Lys Leu Pro Lys Pro His
290 295 300

<210> 87
<211> 912
<212> DNA
<213> Streptococcus agalactiae

<400> 87
ttgaaattag gtattacaac attcggagag acaacaatcc ttgaagaaac aaaccaaagc 60
tattcacatc ctgagaggat tcgccaatta gttgctgaga ttgaactagc tgatcaagtt 120
ggtttagatg tatatggtat tggagagcac catcgtgaag attttgcggt ctctgcaccc 180
gaaattatcc tagcagcagg agcggttaga actaataata tccgtttatc tagtgcagta 240
acgattctct cttccaatga tcctattcgc gtctatcagc aattttcaac gattgacgca 300
ctttcaaatg gtagagcaga aattatggca gggcgtggtt cctttattga gtcttttcca 360
ttgtttggat acgatttagc ggattatgat gatttattta atgaaaaaat ggatatgttg 420
ttagcaatta actcagcgac aaatctcgat tggaaaggtc atttgacaca aacagttaat 480
gagcgaccaa tttatccaag agcattacaa agacagttat caatatgggt ggcaacagga 540
ggaaatgttg attctacaat tcgtattgca gaacaaggtt tgccaattgt ttatgcaact 600
attggtggga atcccaaagc ctttcgtcaa ttggtccata tttataaaga agttggtaag 660
tccgtaatgg acacaaacca ggaacaacta aaagttgctg ctcactcttg gggatggatt 720
gaagaggata atcaaaccgc tattgaccgt tatttttcc ctacgaaaca gaccgtcgat 780
aatattgcta agggacgccc tcattggtct gaaatgacta aagagcagta tttacgttca 840
ataggtccag aaggtgctat ttttgtagga aatcctgaag tggttgcaca taaaattata 900
ggactttggt ga 912

<210> 88
<211> 303
<212> PRT
<213> Streptococcus agalactiae

<400> 88
Met Lys Leu Gly Ile Thr Thr Phe Gly Glu Thr Thr Ile Leu Glu Glu
1 5 10 15

Thr Asn Gln Ser Tyr Ser His Pro Glu Arg Ile Arg Gln Leu Val Ala
20 25 30

Glu Ile Glu Leu Ala Asp Gln Val Gly Leu Asp Val Tyr Gly Ile Gly
35 40 45

Glu His His Arg Glu Asp Phe Ala Val Ser Ala Pro Glu Ile Ile Leu
50 55 60

Ala Ala Gly Ala Val Arg Thr Asn Asn Ile Arg Leu Ser Ser Ala Val
65 70 75 80

Thr Ile Leu Ser Ser Asn Asp Pro Ile Arg Val Tyr Gln Gln Phe Ser
85 90 95

Thr Ile Asp Ala Leu Ser Asn Gly Arg Ala Glu Ile Met Ala Gly Arg
100 105 110

Gly Ser Phe Ile Glu Ser Phe Pro Leu Phe Gly Tyr Asp Leu Ala Asp
115 120 125

Tyr Asp Asp Leu Phe Asn Glu Lys Met Asp Met Leu Leu Ala Ile Asn
130 135 140

Ser Ala Thr Asn Leu Asp Trp Lys Gly His Leu Thr Gln Thr Val Asn
145 150 155 160

Glu Arg Pro Ile Tyr Pro Arg Ala Leu Gln Arg Gln Leu Ser Ile Trp
165 170 175

Val Ala Thr Gly Gly Asn Val Asp Ser Thr Ile Arg Ile Ala Glu Gln
180 185 190

Gly Leu Pro Ile Val Tyr Ala Thr Ile Gly Gly Asn Pro Lys Ala Phe
195 200 205

Arg Gln Leu Val His Ile Tyr Lys Glu Val Gly Lys Ser Val Met Asp
210 215 220

Thr Asn Gln Glu Gln Leu Lys Val Ala Ala His Ser Trp Gly Trp Ile
225 230 235 240

100

Glu Glu Asp Asn Gln Thr Ala Ile Asp Arg Tyr Phe Phe Pro Thr Lys
245 250 255

Gln Thr Val Asp Asn Ile Ala Lys Gly Arg Pro His Trp Ser Glu Met
260 265 270

Thr Lys Glu Gln Tyr Leu Arg Ser Ile Gly Pro Glu Gly Ala Ile Phe
275 280 285

Val Gly Asn Pro Glu Val Val Ala His Lys Ile Ile Gly Leu Trp
290 295 300

<210> 89
<211> 693
<212> DNA
<213> Streptococcus agalactiae

<400> 89
atgatagagt ggattcaaac acatttacca aatgtatatc aaatgggttg ggaaggtgct 60
tacggctggc agacagctat tgtacaaacc ctttatatga ctttttggtc gttccttatt 120
ggaggtttaa tgggattgtt aggaggttta ttccttgttt taactagtcc tagaggagtt 180
attgctaata aattagtatt tggagtttta gataaagttg tttctgtttt tagagctctg 240
cccttcatta ttcttcttgc tttgattgcg ccagtaactc gcgtaattgt aggaacaaca 300
cttggttcac cagcagcttt ggtaccttct tctttggcag ttttcccatt ttttgctcgt 360
caagttcaag ttgttttagc tgaacttgat ggtggagtta ttgaggctgc acaagcctca 420
ggtggaacac tttgggatat tattgtagtt tatcttcgtg aaggtctacc agatttaatt 480
cgagtatcaa cggttacttt gatttcttta gtaggtgaaa cagctatggc tggcgctatt 540
ggtgcaggag gattgggttc tgttgctatt actaaaggat ataactattc tcgtgatgat 600
attactttag tagcgactat tctgatttta ttattaattt tctttatcca atttttaggt 660
gatttttttaa cacgtcgctt gagtcataaa taa 693

<210> 90
<211> 230
<212> PRT
<213> Streptococcus agalactiae

<400> 90

Met Ile Glu Trp Ile Gln Thr His Leu Pro Asn Val Tyr Gln Met Gly
1 5 10 15

Trp Glu Gly Ala Tyr Gly Trp Gln Thr Ala Ile Val Gln Thr Leu Tyr
20 25 30

Met Thr Phe Trp Ser Phe Leu Ile Gly Gly Leu Met Gly Leu Leu Gly
35 40 45

Gly Leu Phe Leu Val Leu Thr Ser Pro Arg Gly Val Ile Ala Asn Lys
50 55 60

Leu Val Phe Gly Val Leu Asp Lys Val Val Ser Val Phe Arg Ala Leu
65 70 75 80

Pro Phe Ile Ile Leu Leu Ala Leu Ile Ala Pro Val Thr Arg Val Ile
85 90 95

Val Gly Thr Thr Leu Gly Ser Pro Ala Ala Leu Val Pro Leu Ser Leu
100 105 110

Ala Val Phe Pro Phe Phe Ala Arg Gln Val Gln Val Val Leu Ala Glu
115 120 125

Leu Asp Gly Gly Val Ile Glu Ala Ala Gln Ala Ser Gly Gly Thr Leu
130 135 140

Trp Asp Ile Ile Val Val Tyr Leu Arg Glu Gly Leu Pro Asp Leu Ile
145 150 155 160

Arg Val Ser Thr Val Thr Leu Ile Ser Leu Val Gly Glu Thr Ala Met
165 170 175

Ala Gly Ala Ile Gly Ala Gly Gly Leu Gly Ser Val Ala Ile Thr Lys
180 185 190

Gly Tyr Asn Tyr Ser Arg Asp Asp Ile Thr Leu Val Ala Thr Ile Leu
195 200 205

Ile Leu Leu Leu Ile Phe Phe Ile Gln Phe Leu Gly Asp Phe Leu Thr
210 215 220

Arg Arg Leu Ser His Lys
225 230

<210> 91
<211> 759
<212> DNA
<213> Streptococcus agalactiae

<400> 91
ttggcagtta gttttcatga agtatttggt tgggattctg ctttttttat tatgattatc 60
aatattccat tgctccttct ttgctacttt ggcttaggta aacaaacctt tttaaaaact 120
gtctatggtt cttggatttt tcctgttttt attaagttaa cacaaagtgt accaactttg 180
acccacaact cactcctcgc agcacttttt ggaggtgtta ttgtaggatg tggtttgggg 240
attgtttttt ggagcgactc ttcaactggt ggaacgggga ttatcattca attcttagga 300
aaatatactc ctataagcct tggacaaggg gttatattga ttgatggact tgttacaatt 360
gttggtttcc tagcttttga cagtgatacg gttatgtttt ctattattgg gttgataact 420
attagttata ttattaatgc tatccaaact ggatttacaa ccttaagcac tgtcttaatc 480
gtttctcaag agcaccaaaa aattaagaca tatatcaata ctgtcgcaga tagaggagta 540
acagaaattc ccgttaaagg gggatattct ggaactaatc aaatcatgct tatgacaact 600
attgctggtt atgagtttgc taaattacaa gaggcaatag cagaaattga cgaaacagcc 660
ttcataacag taactccaac atcacaagct tctggacgtg gatttagtct tcaaaaaaat 720
catggacgtc ttgatgaaga cattcttatg ccaatgtaa 759

<210> 92
<211> 252
<212> PRT
<213> Streptococcus agalactiae

<400> 92

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Met Ala Val Ser Phe His Glu Val Phe Gly Trp Asp Ser Ala Phe Phe
 1               5                  10                  15

Ile Met Ile Ile Asn Ile Pro Leu Leu Leu Leu Cys Tyr Phe Gly Leu
            20                  25                  30

Gly Lys Gln Thr Phe Leu Lys Thr Val Tyr Gly Ser Trp Ile Phe Pro
        35                  40                  45

Val Phe Ile Lys Leu Thr Gln Ser Val Pro Thr Leu Thr His Asn Ser
    50                  55                  60

Leu Leu Ala Ala Leu Phe Gly Gly Val Ile Val Gly Cys Gly Leu Gly
65                  70                  75                  80

Ile Val Phe Trp Ser Asp Ser Ser Thr Gly Gly Thr Gly Ile Ile Ile
                85                  90                  95

Gln Phe Leu Gly Lys Tyr Thr Pro Ile Ser Leu Gly Gln Gly Val Ile
            100                 105                 110

Leu Ile Asp Gly Leu Val Thr Ile Val Gly Phe Leu Ala Phe Asp Ser
        115                 120                 125

Asp Thr Val Met Phe Ser Ile Ile Gly Leu Ile Thr Ile Ser Tyr Ile
    130                 135                 140

Ile Asn Ala Ile Gln Thr Gly Phe Thr Thr Leu Ser Thr Val Leu Ile
145                 150                 155                 160

Val Ser Gln Glu His Gln Lys Ile Lys Thr Tyr Ile Asn Thr Val Ala
                165                 170                 175
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Asp Arg Gly Val Thr Glu Ile Pro Val Lys Gly Gly Tyr Ser Gly Thr
180 185 190

Asn Gln Ile Met Leu Met Thr Thr Ile Ala Gly Tyr Glu Phe Ala Lys
195 200 205

Leu Gln Glu Ala Ile Ala Glu Ile Asp Glu Thr Ala Phe Ile Thr Val
210 215 220

Thr Pro Thr Ser Gln Ala Ser Gly Arg Gly Phe Ser Leu Gln Lys Asn
225 230 235 240

His Gly Arg Leu Asp Glu Asp Ile Leu Met Pro Met
245 250

<210> 93
<211> 549
<212> DNA
<213> Streptococcus agalactiae

<400> 93
atgaaagaaa aacagtcgaa aaggcttatt tatatactac tgattgttcc cattatcttt 60
ataagtgttt ttacatacag tattagccag ccttctaaac tacttccacc aaaagaatta 120
gttattctaa gtccaaatag tcaagccatt ttaacaggaa cgattccagc ttttgaggaa 180
aaatacggta taaaagttaa gcttattcaa ggtgggacag ggcaactaat agatagatta 240
agtaaggagg gtaagcagtt gaaggcggat attttctttg gaggaaatta tacgcaattt 300
gaaagtcata aggcattgtt tgagtcttac gtatcaaaga atgttcatac tgttattcca 360
gactatatcc atccgagtga tacggcgaca ccttatacta taaatgggag tgtcttgatt 420
gtaaataacg aattagctaa gggacttacc atcaagagtt atgaagattt attacagcct 480
tccttaaaag gtaaaattgc ctttgcagat cctctagagt cgacctgcaa gcatgcaagc 540
ttggcgtaa 549

<210> 94
<211> 182
<212> PRT
<213> Streptococcus agalactiae

<400> 94

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Met Lys Glu Lys Gln Ser Lys Arg Leu Ile Tyr Ile Leu Leu Ile Val
  1               5                  10                  15

Pro Ile Ile Phe Ile Ser Val Phe Thr Tyr Ser Ile Ser Gln Pro Ser
             20                  25                  30

Lys Leu Leu Pro Pro Lys Glu Leu Val Ile Leu Ser Pro Asn Ser Gln
         35                  40                  45

Ala Ile Leu Thr Gly Thr Ile Pro Ala Phe Glu Glu Lys Tyr Gly Ile
     50                  55                  60

Lys Val Lys Leu Ile Gln Gly Gly Thr Gly Gln Leu Ile Asp Arg Leu
 65                  70                  75                  80

Ser Lys Glu Gly Lys Gln Leu Lys Ala Asp Ile Phe Phe Gly Gly Asn
                 85                  90                  95

Tyr Thr Gln Phe Glu Ser His Lys Ala Leu Phe Glu Ser Tyr Val Ser
            100                 105                 110

Lys Asn Val His Thr Val Ile Pro Asp Tyr Ile His Pro Ser Asp Thr
        115                 120                 125

Ala Thr Pro Tyr Thr Ile Asn Gly Ser Val Leu Ile Val Asn Asn Glu
    130                 135                 140

Leu Ala Lys Gly Leu Thr Ile Lys Ser Tyr Glu Asp Leu Leu Gln Pro
145                 150                 155                 160

Ser Leu Lys Gly Lys Ile Ala Phe Ala Asp Pro Leu Glu Ser Thr Cys
                165                 170                 175
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Lys His Ala Ser Leu Ala
180

<210> 95
<211> 368
<212> DNA
<213> Streptococcus agalactiae

<400> 95
cctcctatca aatgatgaca aacgtgagag gtacatggaa caaatgctct ttaaaattga 60
aaatgcaacc tggcagcgtg tggtaagagc actttatcgt aaatacaata aggaattttt 120
tacatatcca gccgccaaaa caaaccacca cgcttttgaa tcaggattgg catatcacac 180
ggcaacaatg gttcgtttgg cagatagtat cggagatatc tatccagaac ttaataaaag 240
tttgatgttt gctggtatta tgctacatga tttagccaag gtcatagagt tatcgggtcc 300
tgataataca gaatatacta ttcgaggtaa tcttatcggt catatttcac ttattgatga 360
ggaattaa 368

<210> 96
<211> 122
<212> PRT
<213> Streptococcus agalactiae

<400> 96
Leu Leu Ser Asn Asp Asp Lys Arg Glu Arg Tyr Met Glu Gln Met Leu
1 5 10 15

Phe Lys Ile Glu Asn Ala Thr Trp Gln Arg Val Val Arg Ala Leu Tyr
20 25 30

Arg Lys Tyr Asn Lys Glu Phe Phe Thr Tyr Pro Ala Ala Lys Thr Asn
35 40 45

His His Ala Phe Glu Ser Gly Leu Ala Tyr His Thr Ala Thr Met Val
50 55 60

Arg Leu Ala Asp Ser Ile Gly Asp Ile Tyr Pro Glu Leu Asn Lys Ser
65 70 75 80

Leu Met Phe Ala Gly Ile Met Leu His Asp Leu Ala Lys Val Ile Glu
85 90 95

Leu Ser Gly Pro Asp Asn Thr Glu Tyr Thr Ile Arg Gly Asn Leu Ile
100 105 110

Gly His Ile Ser Leu Ile Asp Glu Glu Leu
115 120

<210> 97
<211> 753
<212> DNA
<213> Streptococcus agalactiae

<400> 97
atgaaaaaaa ataaaattat ccgattcagt ttagttggtg ttctacttgc gatactatgc 60
tttagtcttt ttgctttatt gaagcctaac agtcaacaat catcatctca aaagttgagg 120
aatgaggata taaaaaagac atcctctcaa aaaagaaata agaaattacg attaccagct 180
gtatcatcaa aagattggaa cttgattttg gtcaatcgtg accataaaca tgaagaatta 240
agtccagatg tggtgcctgt tgaaaatatt tatttggata aacgtattac gaagcaagct 300
actcagtttt tagaggctgc tagagcaatt gattcacgag aacatttaat ttcgggttat 360
cgtagtgttg cctatcagga gaagttgttc aattcttatg ttactcaaga gatgactagt 420
aaccctaatt tgacgagggg acaagcagaa aagttggtaa aaacttactc tcagcctgca 480
ggtgctagtg aacaccagac tggattagcg atggatatga gtactgtaga ttctttgaat 540
gagagcgatc ctagagtagt cagtcagttg aaaaagatag ctccacaata tggttttgtc 600
ttacggtttc cggatggtaa aacagcagaa acaggggtag gttatgaaga ttggcattac 660
cgctatgttg gggtagagtc tgcaaaatat atggtcaaac atcatttaac attagaagaa 720
tacataactt tattaaagga gaataaccaa tga 753

<210> 98
<211> 250
<212> PRT
<213> Streptococcus agalactiae

<400> 98

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Met Lys Lys Asn Lys Ile Ile Arg Phe Ser Leu Val Gly Val Leu Leu
 1               5                  10                  15

Ala Ile Leu Cys Phe Ser Leu Phe Ala Leu Leu Lys Pro Asn Ser Gln
            20                  25                  30

Gln Ser Ser Ser Gln Lys Leu Arg Asn Glu Asp Ile Lys Lys Thr Ser
        35                  40                  45

Ser Gln Lys Arg Asn Lys Lys Leu Arg Leu Pro Ala Val Ser Ser Lys
    50                  55                  60

Asp Trp Asn Leu Ile Leu Val Asn Arg Asp His Lys His Glu Glu Leu
65                  70                  75                  80

Ser Pro Asp Val Val Pro Val Glu Asn Ile Tyr Leu Asp Lys Arg Ile
                85                  90                  95

Thr Lys Gln Ala Thr Gln Phe Leu Glu Ala Ala Arg Ala Ile Asp Ser
            100                 105                 110

Arg Glu His Leu Ile Ser Gly Tyr Arg Ser Val Ala Tyr Gln Glu Lys
        115                 120                 125

Leu Phe Asn Ser Tyr Val Thr Gln Glu Met Thr Ser Asn Pro Asn Leu
    130                 135                 140

Thr Arg Gly Gln Ala Glu Lys Leu Val Lys Thr Tyr Ser Gln Pro Ala
145                 150                 155                 160

Gly Ala Ser Glu His Gln Thr Gly Leu Ala Met Asp Met Ser Thr Val
                165                 170                 175
```

Asp Ser Leu Asn Glu Ser Asp Pro Arg Val Val Ser Gln Leu Lys Lys
180 185 190

Ile Ala Pro Gln Tyr Gly Phe Val Leu Arg Phe Pro Asp Gly Lys Thr
195 200 205

Ala Glu Thr Gly Val Gly Tyr Glu Asp Trp His Tyr Arg Tyr Val Gly
210 215 220

Val Glu Ser Ala Lys Tyr Met Val Lys His His Leu Thr Leu Glu Glu
225 230 235 240

Tyr Ile Thr Leu Leu Lys Glu Asn Asn Gln
245 250

<210> 99
<211> 351
<212> DNA
<213> Streptococcus agalactiae

<400> 99
ctgttatgtg gatttcttcc atcaattcct gtgtctaatt ccgggggta tggtataata 60
acagttatga aaaataaaaa aatcttattt gggactggcc ttgctggtgt gggtttactg 120
gcagctgctg gttataccct aactaaaaaa gtaacagatt ataaacgtca gcaaatcact 180
cagaccttaa gagaactttt tagtcagatg ggtgatattc aggtatttta ttttaatgaa 240
tttgaatctg atattaaaat gaccagtggt ggtcttgtct tggaagatgg cagaattttc 300
gaattcattt atcgtcaagg tgttcttgat tatgtggagg tgagcaaatg a 351

<210> 100
<211> 116
<212> PRT
<213> Streptococcus agalactiae

<400> 100
Leu Leu Cys Gly Phe Leu Pro Ser Ile Pro Val Ser Asn Ser Gly Gly
1 5 10 15

110

Tyr Gly Ile Ile Thr Val Met Lys Asn Lys Lys Ile Leu Phe Gly Thr
20 25 30

Gly Leu Ala Gly Val Gly Leu Leu Ala Ala Ala Gly Tyr Thr Leu Thr
35 40 45

Lys Lys Val Thr Asp Tyr Lys Arg Gln Gln Ile Thr Gln Thr Leu Arg
50 55 60

Glu Leu Phe Ser Gln Met Gly Asp Ile Gln Val Phe Tyr Phe Asn Glu
65 70 75 80

Phe Glu Ser Asp Ile Lys Met Thr Ser Gly Gly Leu Val Leu Glu Asp
85 90 95

Gly Arg Ile Phe Glu Phe Ile Tyr Arg Gln Gly Val Leu Asp Tyr Val
100 105 110

Glu Val Ser Lys
115

<210> 101
<211> 310
<212> DNA
<213> Streptococcus agalactiae

<400> 101
atgtatcaaa ctcagacaaa taaggaaaaa tttgttttat ttttgaaatt atttatccca 60
gtattgattt atcaatttgc taatttttca gctactttta ttgattcggt tatgactgga 120
cagtatagtc agctacattt ggcaggtgtg tcaactgcta gtaatttatg gactccgttt 180
ttcgctttat tagtaggtat gatttcagca ttagtaccag tagttggtca acatttgggt 240
agaggaaata aagaacaaat tcgcacagaa tttcatcaat ttctatattt aggtttgata 300
ctgtccttaa 310

<210> 102
<211> 103
<212> PRT
<213> Streptococcus agalactiae

<400> 102
Met Tyr Gln Thr Gln Thr Asn Lys Glu Lys Phe Val Leu Phe Leu Lys
1 5 10 15

Leu Phe Ile Pro Val Leu Ile Tyr Gln Phe Ala Asn Phe Ser Ala Thr
20 25 30

Phe Ile Asp Ser Val Met Thr Gly Gln Tyr Ser Gln Leu His Leu Ala
35 40 45

Gly Val Ser Thr Ala Ser Asn Leu Trp Thr Pro Phe Phe Ala Leu Leu
50 55 60

Val Gly Met Ile Ser Ala Leu Val Pro Val Val Gly Gln His Leu Gly
65 70 75 80

Arg Gly Asn Lys Glu Gln Ile Arg Thr Glu Phe His Gln Phe Leu Tyr
85 90 95

Leu Gly Leu Ile Leu Ser Leu
100

<210> 103
<211> 1098
<212> DNA
<213> Streptococcus agalactiae

<400> 103
ctgctctttt tagctaactt ttctaattta tggtataatt gtatggattg tttagctaga 60
atggagaaga tgatgcaaga tgttttcatt ataggaagta gagggttgcc agctcgttac 120
ggtggttttg aaacttttgt ttcagaattg attaatcatc aaaaaagttc cgacataaaa 180

taccatgttg catgccttag tgataaagaa catcatactc attttaactt tgctgacgct 240
gattgtttta ctataaatcc tccccaatta gggccagcac gtgtgattgc ttatgatatt 300
atggccatta attatgccct tgacttggtt aagacacatg atttaaaaga gcctattttt 360
tatattttag gaaatacaat tggtgccttt atttggcatt ttgccaataa aatacataaa 420
gtcggtggct tattgtatgt taatccggat ggtttagagt ggaagcgatc aaagtggtct 480
cgtcccacac agcgttattt aaaatacgcc gaaaaatgta tgactaaaaa tgcagaccta 540
attatttctg ataatattgg tattgaaaat tacattcaat ctacctactc taatgtgaag 600
acaaggttca ttgcttacgg tacagagatt aattctagga aattatcgtc agatgatcca 660
cgtgtcaaac agttgtttaa aaaatggaat attaagtcta agggttacta tctaatcgtt 720
ggtcgatttg tccctgaaaa caattatgaa acggctatta gggagttcat ggcttcagat 780
actaagcgtg atttagttat tatctgtaac catcaaaata acccctactt tgaaaagttg 840
tccttaaaga caaaccttca acaagataaa agagttaagt ttgtaggtac gctctatgaa 900
aaagatctgc tggattatgt tcgtcaacaa gcctttgctt atattcatgg gcatgaagtt 960
ggcggtacta atccaggact gcttgaggct ttagctaata ctgatttgaa tcttgttcta 1020
gatgttgatt tcaacaaatc agtagcaggt ctctcaagtt tttactggac taaaaaagag 1080
ggggatttag ctaagctt 1098

<210> 104
<211> 366
<212> PRT
<213> Streptococcus agalactiae

<400> 104
Met Leu Phe Leu Ala Asn Phe Ser Asn Leu Trp Tyr Asn Cys Met Asp
1 5 10 15

Cys Leu Ala Arg Met Glu Lys Met Met Gln Asp Val Phe Ile Ile Gly
20 25 30

Ser Arg Gly Leu Pro Ala Arg Tyr Gly Gly Phe Glu Thr Phe Val Ser
35 40 45

Glu Leu Ile Asn His Gln Lys Ser Ser Asp Ile Lys Tyr His Val Ala
50 55 60

Cys Leu Ser Asp Lys Glu His His Thr His Phe Asn Phe Ala Asp Ala
65 70 75 80

Asp Cys Phe Thr Ile Asn Pro Pro Gln Leu Gly Pro Ala Arg Val Ile
85 90 95

Ala Tyr Asp Ile Met Ala Ile Asn Tyr Ala Leu Asp Leu Val Lys Thr
100 105 110

His Asp Leu Lys Glu Pro Ile Phe Tyr Ile Leu Gly Asn Thr Ile Gly
115 120 125

Ala Phe Ile Trp His Phe Ala Asn Lys Ile His Lys Val Gly Gly Leu
130 135 140

Leu Tyr Val Asn Pro Asp Gly Leu Glu Trp Lys Arg Ser Lys Trp Ser
145 150 155 160

Arg Pro Thr Gln Arg Tyr Leu Lys Tyr Ala Glu Lys Cys Met Thr Lys
165 170 175

Asn Ala Asp Leu Ile Ile Ser Asp Asn Ile Gly Ile Glu Asn Tyr Ile
180 185 190

Gln Ser Thr Tyr Ser Asn Val Lys Thr Arg Phe Ile Ala Tyr Gly Thr
195 200 205

Glu Ile Asn Ser Arg Lys Leu Ser Ser Asp Asp Pro Arg Val Lys Gln
210 215 220

Leu Phe Lys Lys Trp Asn Ile Lys Ser Lys Gly Tyr Tyr Leu Ile Val
225 230 235 240

Gly Arg Phe Val Pro Glu Asn Asn Tyr Glu Thr Ala Ile Arg Glu Phe
245 250 255

Met Ala Ser Asp Thr Lys Arg Asp Leu Val Ile Ile Cys Asn His Gln
260 265 270

Asn Asn Pro Tyr Phe Glu Lys Leu Ser Leu Lys Thr Asn Leu Gln Gln
275 280 285

```
Asp Lys Arg Val Lys Phe Val Gly Thr Leu Tyr Glu Lys Asp Leu Leu
    290                 295                 300

Asp Tyr Val Arg Gln Gln Ala Phe Ala Tyr Ile His Gly His Glu Val
305                 310                 315                 320

Gly Gly Thr Asn Pro Gly Leu Leu Glu Ala Leu Ala Asn Thr Asp Leu
                325                 330                 335

Asn Leu Val Leu Asp Val Asp Phe Asn Lys Ser Val Ala Gly Leu Ser
            340                 345                 350

Ser Phe Tyr Trp Thr Lys Lys Glu Gly Asp Leu Ala Lys Leu
        355                 360                 365
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<210> 105
<211> 546
<212> DNA
<213> Streptococcus agalactiae

<400> 105

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ttgaggagta atatggtaaa gacagcagtt ttaatggcga catacaatgg cgaaaaattt 60
atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120
agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180
gagttagaag gctggaaaat tgttaaaaac gacaaaaact taggctggcg tttaaatttt 240
cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300
gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360
caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420
ccacattttc taacttttтc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480
tatcaaacat tccgtcccgg atggaccatt gctatgaaga gagattttgc gcaagctatc 540
gcttga                                                          546
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<210> 106
<211> 181
<212> PRT
<213> Streptococcus agalactiae

<400> 106

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Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn
 1               5                  10                  15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr
            20                  25                  30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu
        35                  40                  45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly
    50                  55                  60

Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe
65                  70                  75                  80

Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe
                85                  90                  95

Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln
            100                 105                 110

Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp
        115                 120                 125

Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu
    130                 135                 140

Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp
145                 150                 155                 160

Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe
                165                 170                 175
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Ala Gln Ala Ile Ala
180

<210> 107
<211> 639
<212> DNA
<213> Streptococcus agalactiae

<400> 107
gtgattatgg ataagtctat tcctaaagca actgctaaac gtttatcact gtactaccgt 60
atttttaaac gttttaatac tgatggcatc gaaaaagcta gttccaaaca aattgcagat 120
gccctaggta tcgattctgc tactgttcga cgtgattttt cttattttgg tgaactagga 180
cgccgtggtt ttggttatga tgtcaaaaaa cttatgaact tctttgcaga aatattgaac 240
gatcattcta caacaaatgt tatgctggtg gggtgtggaa atatcggtag agctctcttg 300
cattatcgtt tccacgatcg caataaaatg caaatttcaa tggcttttga tttagatagc 360
aatgatttag ttggtaaaac aaccgaggat ggaattcctg tctacggtat ttcgactatc 420
aatgaccatt taatagatag tgatattgaa actgctatcc taacagtacc tagtacagaa 480
gcccaagaag ttgctgacat cttagtcaaa gcaggtataa aaggcatctt gagtttttct 540
ccagttcatt taacattacc aaaagatatc attgttcagt atgtagattt aacaagcgaa 600
ttacaaactt tactttattt catgaaccag cagcgataa 639

<210> 108
<211> 212
<212> PRT
<213> Streptococcus agalactiae

<400> 108
Met Ile Met Asp Lys Ser Ile Pro Lys Ala Thr Ala Lys Arg Leu Ser
1 5 10 15

Leu Tyr Tyr Arg Ile Phe Lys Arg Phe Asn Thr Asp Gly Ile Glu Lys
20 25 30

Ala Ser Ser Lys Gln Ile Ala Asp Ala Leu Gly Ile Asp Ser Ala Thr
35 40 45

Val Arg Arg Asp Phe Ser Tyr Phe Gly Glu Leu Gly Arg Arg Gly Phe
50 55 60

Gly Tyr Asp Val Lys Lys Leu Met Asn Phe Phe Ala Glu Ile Leu Asn
65 70 75 80

Asp His Ser Thr Thr Asn Val Met Leu Val Gly Cys Gly Asn Ile Gly
85 90 95

Arg Ala Leu Leu His Tyr Arg Phe His Asp Arg Asn Lys Met Gln Ile
100 105 110

Ser Met Ala Phe Asp Leu Asp Ser Asn Asp Leu Val Gly Lys Thr Thr
115 120 125

Glu Asp Gly Ile Pro Val Tyr Gly Ile Ser Thr Ile Asn Asp His Leu
130 135 140

Ile Asp Ser Asp Ile Glu Thr Ala Ile Leu Thr Val Pro Ser Thr Glu
145 150 155 160

Ala Gln Glu Val Ala Asp Ile Leu Val Lys Ala Gly Ile Lys Gly Ile
165 170 175

Leu Ser Phe Ser Pro Val His Leu Thr Leu Pro Lys Asp Ile Ile Val
180 185 190

Gln Tyr Val Asp Leu Thr Ser Glu Leu Gln Thr Leu Leu Tyr Phe Met
195 200 205

Asn Gln Gln Arg
210

<210> 109
<211> 476
<212> DNA
<213> Streptococcus agalactiae

<400> 109
atgggtgcta aaggagcaga tgtcattctc gttttatcac actctggcat tggagatgat 60
cgatatgaag aaggtgaaga aaacgttggc tatcaaattg ccagcatcaa gggagtggat 120
gccgttgtta cgggacactc acacgctgaa tttccatcag gtaacggtac tggcttctat 180
gaaaaatata ctggagttga tggtatcaat ggaaaaataa atggaacacc tgttacaatg 240
gcaggcaagt acgggggatca ccttggtatt attgatttag gacttagtta tactaatgga 300
aaatggcaag tctccgaaag cagtgctaaa atccgtaaaa ttgatatgaa ctcaacaact 360
gctgacgagc gtatcattgc attggctaag gaagcacacg atggcactat caactatgtt 420
cgccaacaag taggtacaac aactgcgcca attacaagtt actttgcact agttaa 476

<210> 110
<211> 158
<212> PRT
<213> Streptococcus agalactiae

<400> 110
Met Gly Ala Lys Gly Ala Asp Val Ile Leu Val Leu Ser His Ser Gly
1 5 10 15

Ile Gly Asp Asp Arg Tyr Glu Glu Gly Glu Glu Asn Val Gly Tyr Gln
20 25 30

Ile Ala Ser Ile Lys Gly Val Asp Ala Val Val Thr Gly His Ser His
35 40 45

Ala Glu Phe Pro Ser Gly Asn Gly Thr Gly Phe Tyr Glu Lys Tyr Thr
50 55 60

Gly Val Asp Gly Ile Asn Gly Lys Ile Asn Gly Thr Pro Val Thr Met
65 70 75 80

Ala Gly Lys Tyr Gly Asp His Leu Gly Ile Ile Asp Leu Gly Leu Ser
85 90 95

Tyr Thr Asn Gly Lys Trp Gln Val Ser Glu Ser Ser Ala Lys Ile Arg
100 105 110

Lys Ile Asp Met Asn Ser Thr Thr Ala Asp Glu Arg Ile Ile Ala Leu
115 120 125

Ala Lys Glu Ala His Asp Gly Thr Ile Asn Tyr Val Arg Gln Gln Val
130 135 140

Gly Thr Thr Thr Ala Pro Ile Thr Ser Tyr Phe Ala Leu Val
145 150 155

<210> 111
<211> 170
<212> DNA
<213> Streptococcus agalactiae

<400> 111
ttgtcaataa ggtttcaaat cagcttgaaa tatgataaaa taaaacagat tgtaagtgac 60
tgtttaagct tgtttttcag agaggttttt atgaatacaa acacaataaa aaaggttgta 120
gcgactggaa ttggagctgc acttttttatc attataggta tgctagttaa 170

<210> 112
<211> 56
<212> PRT
<213> Streptococcus agalactiae

<400> 112
Met Ser Ile Arg Phe Gln Ile Ser Leu Lys Tyr Asp Lys Ile Lys Gln
1 5 10 15

Ile Val Ser Asp Cys Leu Ser Leu Phe Phe Arg Glu Val Phe Met Asn
20 25 30

Thr Asn Thr Ile Lys Lys Val Val Ala Thr Gly Ile Gly Ala Ala Leu
35 40 45

Phe Ile Ile Ile Gly Met Leu Val
50 55

<210> 113
<211> 242
<212> DNA
<213> Streptococcus agalactiae

<400> 113
atgaaacatt taaaatttca atcggtcttc gacattattg gtcctgttat gattggacca 60
tcaagtagtc atactgcagg agctgtccgc attggtaaag ttgtccattc tatttttggt 120
gaacctagtg aagtaacctt tcatttatac aattcttttg ctaaaactta ccaaggacac 180
ggtactgata aagcattggt tgcagggatt ctaggaatgg atacagataa tccagatatt 240
aa 242

<210> 114
<211> 80
<212> PRT
<213> Streptococcus agalactiae

<400> 114
Met Lys His Leu Lys Phe Gln Ser Val Phe Asp Ile Ile Gly Pro Val
1 5 10 15

Met Ile Gly Pro Ser Ser Ser His Thr Ala Gly Ala Val Arg Ile Gly
20 25 30

Lys Val Val His Ser Ile Phe Gly Glu Pro Ser Glu Val Thr Phe His
35 40 45

Leu Tyr Asn Ser Phe Ala Lys Thr Tyr Gln Gly His Gly Thr Asp Lys
50 55 60

Ala Leu Val Ala Gly Ile Leu Gly Met Asp Thr Asp Asn Pro Asp Ile
65 70 75 80

<210> 115
<211> 122
<212> DNA
<213> Streptococcus agalactiae

<400> 115
gtgtcagaag gtgttttaat gtttctaaaa gaagatgacg tagagacttt tcttcatatc 60
ctgacaaatt catttagcca atttatggca caatttgatt tgtgtcataa ggaaatgatt 120
aa 122

<210> 116
<211> 83
<212> DNA
<213> Streptococcus agalactiae

<400> 116
atgacctaca aagattacac aggtttagat cggactgaac ttttgagtaa agtgcgtcat 60
atgatgtccg acaaacgttt taa 83

<210> 117
<211> 27
<212> PRT
<213> Streptococcus agalactiae

<400> 117
Met Thr Tyr Lys Asp Tyr Thr Gly Leu Asp Arg Thr Glu Leu Leu Ser
1 5 10 15

Lys Val Arg His Met Met Ser Asp Lys Arg Phe
20 25

<210> 118
<211> 94
<212> DNA
<213> Streptococcus agalactiae

<400> 118
ctgagttggg tcttggaaac ggtcctgtca atcatactag ctatcaagga gactaaaatg 60
tatttagaac aactaaaaga ggtaaatcct ttaa 94

<210> 119
<211> 31
<212> PRT
<213> Streptococcus agalactiae

<400> 119
Met Ser Trp Val Leu Glu Thr Val Leu Ser Ile Ile Leu Ala Ile Lys
1 5 10 15

Glu Thr Lys Met Tyr Leu Glu Gln Leu Lys Glu Val Asn Pro Leu
20 25 30

<210> 120
<211> 1230
<212> DNA
<213> Streptococcus agalactiae

<400> 120
gtgaaaaaaa aattagtctc atcacttcta aagtgttctc taatcattat tgttagcttt 60
gctggtggag catttgctag ttttgtcatg aatcataatg acaatattcc aaatggtggt 120
gtcactaaaa ctagtaaagt aaattataat aacataacgc ctacaacaaa agctgttaaa 180
aaggtacaaa atagtgttgt ttctgttatc aattataaac aacaagagag tcgttctgac 240

ctatcagact tctatagtca ttttttggt aatcaggggg gcaacactga taagggctta 300
caagtttacg gtgaaggctc tggagtcatc tataaaaaag atggtaaaaa tgcctatgtt 360
gtcactaata accacgtcat tgatggggct aaacaaattg aaattcaact agctgatggc 420
tcaaaagcag ttgggaaact tgttgggtca gatacctact ctgatttagc cgtcgtcaaa 480
attccatcag ataaagtttc aaatattgca gaatttgctg attcatcaaa actcaacatt 540
ggtgaaactg ctatagcgat cggaagccct cttggaactg agtatgcaaa ttctgtaact 600
caaggtattg tatctagttt aaaaagaact gtaacaatga ctaatgaaga aggacaaaca 660
gtttctacaa atgctatcca gacggatgct gctatcaatc ctggtaattc aggtggagca 720
cttatcaata ttgaaggaca ggttattgga attaattcta gtaaaatttc ttctacatca 780
aatcaaacct caggacaatc gtcaggaaat agcgttgaag gtatgggatt tgccattcct 840
tcaaatgatg ttgttaagat tatcaatcaa cttgagagta acggacaagt agagagacct 900
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gatttagcta aacaacgagc aaataactaa 1230

<210> 121
<211> 409
<212> PRT
<213> Streptococcus agalactiae

<400> 121
Met Lys Lys Lys Leu Val Ser Ser Leu Leu Lys Cys Ser Leu Ile Ile
1 5 10 15

Ile Val Ser Phe Ala Gly Gly Ala Phe Ala Ser Phe Val Met Asn His
20 25 30

Asn Asp Asn Ile Pro Asn Gly Gly Val Thr Lys Thr Ser Lys Val Asn
35 40 45

Tyr Asn Asn Ile Thr Pro Thr Thr Lys Ala Val Lys Lys Val Gln Asn
50 55 60

Ser Val Val Ser Val Ile Asn Tyr Lys Gln Gln Glu Ser Arg Ser Asp
65 70 75 80

Leu Ser Asp Phe Tyr Ser His Phe Phe Gly Asn Gln Gly Gly Asn Thr
85 90 95

Asp Lys Gly Leu Gln Val Tyr Gly Glu Gly Ser Gly Val Ile Tyr Lys
100 105 110

Lys Asp Gly Lys Asn Ala Tyr Val Val Thr Asn Asn His Val Ile Asp
115 120 125

Gly Ala Lys Gln Ile Glu Ile Gln Leu Ala Asp Gly Ser Lys Ala Val
130 135 140

Gly Lys Leu Val Gly Ser Asp Thr Tyr Ser Asp Leu Ala Val Val Lys
145 150 155 160

Ile Pro Ser Asp Lys Val Ser Asn Ile Ala Glu Phe Ala Asp Ser Ser
165 170 175

Lys Leu Asn Ile Gly Glu Thr Ala Ile Ala Ile Gly Ser Pro Leu Gly
180 185 190

Thr Glu Tyr Ala Asn Ser Val Thr Gln Gly Ile Val Ser Ser Leu Lys
195 200 205

Arg Thr Val Thr Met Thr Asn Glu Glu Gly Gln Thr Val Ser Thr Asn
210 215 220

Ala Ile Gln Thr Asp Ala Ala Ile Asn Pro Gly Asn Ser Gly Gly Ala
225 230 235 240

Leu Ile Asn Ile Glu Gly Gln Val Ile Gly Ile Asn Ser Ser Lys Ile
245 250 255

Ser Ser Thr Ser Asn Gln Thr Ser Gly Gln Ser Ser Gly Asn Ser Val
260 265 270

Glu Gly Met Gly Phe Ala Ile Pro Ser Asn Asp Val Val Lys Ile Ile
275 280 285

Asn Gln Leu Glu Ser Asn Gly Gln Val Glu Arg Pro Ala Leu Gly Ile
290 295 300

Ser Met Ala Gly Leu Ser Asn Leu Pro Ser Asp Val Ile Ser Lys Leu
305 310 315 320

Lys Ile Pro Ser Asn Val Thr Asn Gly Ile Val Val Ala Ser Ile Gln
325 330 335

Ser Gly Met Pro Ala Gln Gly Lys Leu Lys Lys Tyr Asp Val Ile Thr
340 345 350

Lys Val Asp Asp Lys Glu Val Ala Ser Pro Ser Asp Leu Gln Ser Leu
355 360 365

Leu Tyr Gly His Gln Val Gly Asp Ser Ile Thr Val Thr Phe Tyr Arg
370 375 380

Gly Glu Asn Lys Gln Thr Val Thr Ile Lys Leu Thr Lys Thr Ser Lys
385 390 395 400

Asp Leu Ala Lys Gln Arg Ala Asn Asn
405

<210> 122
<211> 1923
<212> DNA
<213> Streptococcus agalactiae

<400> 122
atgttaaaat ggtatacaaa caaaggaggg aggatgataa tgaagaaatg ttttttggct 60
atttgtttag ctcttagttt ttttatggtt tcagttcaag cagatgaggt ggactataac 120

attcctcatt atgagggtaa tctaactatt cacaatgata atagtgctga ttttacagag 180
aaggttactt accaatttga ttcgtcctat aatggacagt atgtcacgtt aggtacggcg 240
ggtaagttat ctgacaattt tgatattaat aataagccac aggttgaagt ttcaattaat 300
ggtaaagtaa ggaaagttag ttaccagata gaagatttgg aggatggcta ccgtttgaaa 360
gtgtttaatg gtggtgaagc aggtgatact gttaaagtca atgttcagtg gaaactaaaa 420
aatgttctat ttatgcataa ggatgttggt gaacttaact ggattcctat tagcgactgg 480
gataaaacgt tagagaaagt agatttttgg atatcaactg acaaaaaggt tgctctttct 540
cgtctttggg ggcacttggg ttatcttaaa actcctccta aaataagaca aaataataat 600
cgttaccatt tgacagcttt taatgtaaac aaacgattag aatttcatgg ttattgggat 660
agatcttatt ttaatctacc tacaaacagt aaaaataatt acaagaaaaa aattgaacat 720
caagagaaga taatagagcg tcatggtttt atcctaagtt tcttgttaag gatattatta 780
ccttcattct ttattattgt gacactattc atctcaatta gggtgttcct gtttagaaaa 840
aaagttaata aatacgggca attccctaag gatcatcatt tatatgaagc acctgaggac 900
ctttcaccat tagagttaac tcaaagcatt tatagtatga gctttaaaaa ttttcaagat 960
gaggagaaga aaactcacct tatcagtcaa gaacaactca tacagtcaat tctattagac 1020
ttgattgata gaaaagtatt gaattatgat gataacttgt tatctctagc taacttagat 1080
agagcttctg atgcagaaat agattttata gagtttgctt ttgcggattc tacgagtttg 1140
aagccagatc aactcttttc taattaccaa tttagttata aagaaacact acgtgaactg 1200
aaaaagcagc acaaggcttc agatctgcaa aatcaaatga gacgccgagg aagtaatgcc 1260
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agaaagggaa tttcatcccc ttatcgtaaa atgtcttcag aagagtctaa agaattatct 1380
aggttaaaaa gattcagtta cctatcacct cttatttctt ttgttgttat aatttatacg 1440
ctttttttaa attattttac ctatttctgt atctatctct tattgtttgg tgttatcctg 1500
ttgttgaata aaatcatttt tatgatgaca agaaaaataa gtaacggtta tattgtaact 1560
gaagatggag caagtcgtgt ctaccaatgg actagtttta ggaacatgct aagggatatc 1620
aaatcgtttg atcgttcaga gttagaaagt atcgtattat ggaatcgaat attggtttac 1680
gctactttat tcggctacgc tgaccgtgtt gagaaagtac tcagagtgaa ccaaatagat 1740
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agtaatcatt tttcaacgat aactgaagat gttagtcacg cttctaattt tagtgttaat 1860
tcaggcggtt cttcaggtgg tttctcaggc ggcggaggcg gcggaggtgg cggtgccttc 1920
taa 1923

<210> 123
<211> 640
<212> PRT
<213> Streptococcus agalactiae

<400> 123

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Met Leu Lys Trp Tyr Thr Asn Lys Gly Gly Arg Met Ile Met Lys Lys
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Cys Phe Leu Ala Ile Cys Leu Ala Leu Ser Phe Phe Met Val Ser Val
            20                  25                  30

Gln Ala Asp Glu Val Asp Tyr Asn Ile Pro His Tyr Glu Gly Asn Leu
        35                  40                  45

Thr Ile His Asn Asp Asn Ser Ala Asp Phe Thr Glu Lys Val Thr Tyr
    50                  55                  60

Gln Phe Asp Ser Ser Tyr Asn Gly Gln Tyr Val Thr Leu Gly Thr Ala
65                  70                  75                  80

Gly Lys Leu Ser Asp Asn Phe Asp Ile Asn Asn Lys Pro Gln Val Glu
                85                  90                  95

Val Ser Ile Asn Gly Lys Val Arg Lys Val Ser Tyr Gln Ile Glu Asp
            100                 105                 110

Leu Glu Asp Gly Tyr Arg Leu Lys Val Phe Asn Gly Gly Glu Ala Gly
        115                 120                 125

Asp Thr Val Lys Val Asn Val Gln Trp Lys Leu Lys Asn Val Leu Phe
    130                 135                 140

Met His Lys Asp Val Gly Glu Leu Asn Trp Ile Pro Ile Ser Asp Trp
145                 150                 155                 160

Asp Lys Thr Leu Glu Lys Val Asp Phe Trp Ile Ser Thr Asp Lys Lys
                165                 170                 175

Val Ala Leu Ser Arg Leu Trp Gly His Leu Gly Tyr Leu Lys Thr Pro
            180                 185                 190
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Pro Lys Ile Arg Gln Asn Asn Asn Arg Tyr His Leu Thr Ala Phe Asn
        195                 200                 205

Val Asn Lys Arg Leu Glu Phe His Gly Tyr Trp Asp Arg Ser Tyr Phe
    210                 215                 220

Asn Leu Pro Thr Asn Ser Lys Asn Asn Tyr Lys Lys Lys Ile Glu His
225                 230                 235                 240

Gln Glu Lys Ile Ile Glu Arg His Gly Phe Ile Leu Ser Phe Leu Leu
                245                 250                 255

Arg Ile Leu Leu Pro Ser Phe Phe Ile Ile Val Thr Leu Phe Ile Ser
            260                 265                 270

Ile Arg Val Phe Leu Phe Arg Lys Lys Val Asn Lys Tyr Gly Gln Phe
        275                 280                 285

Pro Lys Asp His His Leu Tyr Glu Ala Pro Glu Asp Leu Ser Pro Leu
    290                 295                 300

Glu Leu Thr Gln Ser Ile Tyr Ser Met Ser Phe Lys Asn Phe Gln Asp
305                 310                 315                 320

Glu Glu Lys Lys Thr His Leu Ile Ser Gln Glu Gln Leu Ile Gln Ser
                325                 330                 335

Ile Leu Leu Asp Leu Ile Asp Arg Lys Val Leu Asn Tyr Asp Asp Asn
            340                 345                 350

Leu Leu Ser Leu Ala Asn Leu Asp Arg Ala Ser Asp Ala Glu Ile Asp
        355                 360                 365

Phe Ile Glu Phe Ala Phe Ala Asp Ser Thr Ser Leu Lys Pro Asp Gln
    370                 375                 380

Leu Phe Ser Asn Tyr Gln Phe Ser Tyr Lys Glu Thr Leu Arg Glu Leu
385                 390                 395                 400
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Lys Lys Gln His Lys Ala Ser Asp Leu Gln Asn Gln Met Arg Arg Arg
405 410 415

Gly Ser Asn Ala Leu Ser Arg Ile Thr Arg Leu Thr Arg Leu Ile Ser
420 425 430

Lys Asp Asn Ile Asn Ser Leu Arg Arg Lys Gly Ile Ser Ser Pro Tyr
435 440 445

Arg Lys Met Ser Ser Glu Glu Ser Lys Glu Leu Ser Arg Leu Lys Arg
450 455 460

Phe Ser Tyr Leu Ser Pro Leu Ile Ser Phe Val Val Ile Ile Tyr Thr
465 470 475 480

Leu Phe Leu Asn Tyr Phe Thr Tyr Phe Cys Ile Tyr Leu Leu Leu Phe
485 490 495

Gly Val Ile Leu Leu Leu Asn Lys Ile Ile Phe Met Met Thr Arg Lys
500 505 510

Ile Ser Asn Gly Tyr Ile Val Thr Glu Asp Gly Ala Ser Arg Val Tyr
515 520 525

Gln Trp Thr Ser Phe Arg Asn Met Leu Arg Asp Ile Lys Ser Phe Asp
530 535 540

Arg Ser Glu Leu Glu Ser Ile Val Leu Trp Asn Arg Ile Leu Val Tyr
545 550 555 560

Ala Thr Leu Phe Gly Tyr Ala Asp Arg Val Glu Lys Val Leu Arg Val
565 570 575

Asn Gln Ile Asp Ile Pro Glu Arg Phe Ala Asn Ile Asp Ser His Arg
580 585 590

Phe Ala Ile Ser Val Asn Gln Ser Ser Asn His Phe Ser Thr Ile Thr
595 600 605

Glu Asp Val Ser His Ala Ser Asn Phe Ser Val Asn Ser Gly Gly Ser
610 615 620

Ser Gly Gly Phe Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala Phe
625 630 635 640

<210> 124
<211> 2712
<212> DNA
<213> Streptococcus agalactiae

<400> 124
atgatgattg tgaataatgg ttatctagaa gggagaaaaa tgaaaaagag acaaaaaata 60
tggagagggt tatcagttac tttactaatc ctgtcccaaa ttccatttgg tatattggta 120
caaggtgaaa cccaagatac caatcaagca cttggaaaag taattgttaa aaaaacggga 180
gacaatgcta caccattagg caaagcgact tttgtgttaa aaaatgacaa tgataagtca 240
gaaacaagtc acgaaacggt agagggttct ggagaagcaa cctttgaaaa cataaaacct 300
ggagactaca cattaagaga agaaacagca ccaattggtt ataaaaaaac tgataaaacc 360
tggaaagtta aagttgcaga taacggagca acaataatcg agggtatgga tgcagataaa 420
gcagagaaac gaaaagaagt tttgaatgcc caatatccaa aatcagctat ttatgaggat 480
acaaaagaaa attacccatt agttaatgta gagggttcca aagttggtga acaatacaaa 540
gcattgaatc caataaatgg aaaagatggt cgaagagaga ttgctgaagg ttggttatca 600
aaaaaaaatc caggggtcaa tgatctcgat aagaataaat ataaaattga attaactgtt 660
gagggtaaaa ccactgttga aacgaaagaa cttaatcaac cactagatgt cgttgtgcta 720
ttagataatt caaatagtat gaataatgaa agagccaata attctcaaag agcattaaaa 780
gctggggaag cagttgaaaa gctgattgat aaaattacat caaataaaga caatagagta 840
gctcttgtga catatgcctc aaccattttt gatggtactg aagcgaccgt atcaaaggga 900
gttgccgatc aaaatggtaa agcgctgaat gatagtgtat catgggatta tcataaaact 960
acttttacag caactacaca taattacagt tatttaaatt taacaaatga tgctaacgaa 1020
gttaatattc taaagtcaag aattccaaag gaagcggagc atataaatgg ggatcgcacg 1080
ctctatcaat ttggtgcgac atttactcaa aaagctctaa tgaaagcaaa tgaaatttta 1140
gagacacaaa gttctaatgc tagaaaaaaa cttatttttc acgtaactga tggtgtccct 1200
acgatgtctt atgccataaa ttttaatcct tatatatcaa catcttacca aaaccagttt 1260

aattcttttt taaataaaat accagataga agtggtattc tccaagagga ttttataatc 1320
aatggtgatg attatcaaat agtaaaagga gatggagaga gttttaaact gttttcggat 1380
agaaaagttc ctgttactgg aggaacgaca caagcagctt atcgagtacc gcaaaatcaa 1440
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caaatcaaaa ctcatggtga gccaacaaca ttatacttta atggaaatat aagacctaaa 1620
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gaagctgaga aatttatgca atcaatatca agtaaaacag aaaattatac taatgttgat 1740
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aaacaattgt aa 2712

<210> 125
<211> 903
<212> PRT
<213> Streptococcus agalactiae

<400> 125
Met Met Ile Val Asn Asn Gly Tyr Leu Glu Gly Arg Lys Met Lys Lys
1 5 10 15

Arg Gln Lys Ile Trp Arg Gly Leu Ser Val Thr Leu Leu Ile Leu Ser
20 25 30

Gln Ile Pro Phe Gly Ile Leu Val Gln Gly Glu Thr Gln Asp Thr Asn
35 40 45

Gln Ala Leu Gly Lys Val Ile Val Lys Lys Thr Gly Asp Asn Ala Thr
50 55 60

Pro Leu Gly Lys Ala Thr Phe Val Leu Lys Asn Asp Asn Asp Lys Ser
65 70 75 80

Glu Thr Ser His Glu Thr Val Glu Gly Ser Gly Glu Ala Thr Phe Glu
85 90 95

Asn Ile Lys Pro Gly Asp Tyr Thr Leu Arg Glu Glu Thr Ala Pro Ile
100 105 110

Gly Tyr Lys Lys Thr Asp Lys Thr Trp Lys Val Lys Val Ala Asp Asn
115 120 125

Gly Ala Thr Ile Ile Glu Gly Met Asp Ala Asp Lys Ala Glu Lys Arg
130 135 140

Lys Glu Val Leu Asn Ala Gln Tyr Pro Lys Ser Ala Ile Tyr Glu Asp
145 150 155 160

Thr Lys Glu Asn Tyr Pro Leu Val Asn Val Glu Gly Ser Lys Val Gly
165 170 175

Glu Gln Tyr Lys Ala Leu Asn Pro Ile Asn Gly Lys Asp Gly Arg Arg
180 185 190

Glu Ile Ala Glu Gly Trp Leu Ser Lys Lys Asn Pro Gly Val Asn Asp
195 200 205

Leu Asp Lys Asn Lys Tyr Lys Ile Glu Leu Thr Val Glu Gly Lys Thr
210 215 220

Thr Val Glu Thr Lys Glu Leu Asn Gln Pro Leu Asp Val Val Val Leu
225 230 235 240

Leu Asp Asn Ser Asn Ser Met Asn Asn Glu Arg Ala Asn Asn Ser Gln
245 250 255

Arg Ala Leu Lys Ala Gly Glu Ala Val Glu Lys Leu Ile Asp Lys Ile
260 265 270

Thr Ser Asn Lys Asp Asn Arg Val Ala Leu Val Thr Tyr Ala Ser Thr
275 280 285

Ile Phe Asp Gly Thr Glu Ala Thr Val Ser Lys Gly Val Ala Asp Gln
290 295 300

Asn Gly Lys Ala Leu Asn Asp Ser Val Ser Trp Asp Tyr His Lys Thr
305 310 315 320

Thr Phe Thr Ala Thr Thr His Asn Tyr Ser Tyr Leu Asn Leu Thr Asn
325 330 335

Asp Ala Asn Glu Val Asn Ile Leu Lys Ser Arg Ile Pro Lys Glu Ala
340 345 350

Glu His Ile Asn Gly Asp Arg Thr Leu Tyr Gln Phe Gly Ala Thr Phe
355 360 365

Thr Gln Lys Ala Leu Met Lys Ala Asn Glu Ile Leu Glu Thr Gln Ser
370 375 380

Ser Asn Ala Arg Lys Lys Leu Ile Phe His Val Thr Asp Gly Val Pro
385 390 395 400

Thr Met Ser Tyr Ala Ile Asn Phe Asn Pro Tyr Ile Ser Thr Ser Tyr
405 410 415

Gln Asn Gln Phe Asn Ser Phe Leu Asn Lys Ile Pro Asp Arg Ser Gly
420 425 430

Ile Leu Gln Glu Asp Phe Ile Ile Asn Gly Asp Asp Tyr Gln Ile Val
435 440 445

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Lys Gly Asp Gly Glu Ser Phe Lys Leu Phe Ser Asp Arg Lys Val Pro
    450                 455                 460

Val Thr Gly Gly Thr Thr Gln Ala Ala Tyr Arg Val Pro Gln Asn Gln
465                 470                 475                 480

Leu Ser Val Met Ser Asn Glu Gly Tyr Ala Ile Asn Ser Gly Tyr Ile
                485                 490                 495

Tyr Leu Tyr Trp Arg Asp Tyr Asn Trp Val Tyr Pro Phe Asp Pro Lys
            500                 505                 510

Thr Lys Lys Val Ser Ala Thr Lys Gln Ile Lys Thr His Gly Glu Pro
        515                 520                 525

Thr Thr Leu Tyr Phe Asn Gly Asn Ile Arg Pro Lys Gly Tyr Asp Ile
    530                 535                 540

Phe Thr Val Gly Ile Gly Val Asn Gly Asp Pro Gly Ala Thr Pro Leu
545                 550                 555                 560

Glu Ala Glu Lys Phe Met Gln Ser Ile Ser Ser Lys Thr Glu Asn Tyr
                565                 570                 575

Thr Asn Val Asp Asp Thr Asn Lys Ile Tyr Asp Glu Leu Asn Lys Tyr
            580                 585                 590

Phe Lys Thr Ile Val Glu Glu Lys His Ser Ile Val Asp Gly Asn Val
        595                 600                 605

Thr Asp Pro Met Gly Glu Met Ile Glu Phe Gln Leu Lys Asn Gly Gln
    610                 615                 620

Ser Phe Thr His Asp Asp Tyr Val Leu Val Gly Asn Asp Gly Ser Gln
625                 630                 635                 640

Leu Lys Asn Gly Val Ala Leu Gly Gly Pro Asn Ser Asp Gly Gly Ile
                645                 650                 655
```

Leu Lys Asp Val Thr Val Thr Tyr Asp Lys Thr Ser Gln Thr Ile Lys
660 665 670

Ile Asn His Leu Asn Leu Gly Ser Gly Gln Lys Val Val Leu Thr Tyr
675 680 685

Asp Val Arg Leu Lys Asp Asn Tyr Ile Ser Asn Lys Phe Tyr Asn Thr
690 695 700

Asn Asn Arg Thr Thr Leu Ser Pro Lys Ser Glu Lys Glu Pro Asn Thr
705 710 715 720

Ile Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg Glu Phe Pro
725 730 735

Val Leu Thr Ile Ser Asn Gln Lys Lys Met Gly Glu Val Glu Phe Ile
740 745 750

Lys Val Asn Lys Asp Lys His Ser Glu Ser Leu Leu Gly Ala Lys Phe
755 760 765

Gln Leu Gln Ile Glu Lys Asp Phe Ser Gly Tyr Lys Gln Phe Val Pro
770 775 780

Glu Gly Ser Asp Val Thr Thr Lys Asn Asp Gly Lys Ile Tyr Phe Lys
785 790 795 800

Ala Leu Gln Asp Gly Asn Tyr Lys Leu Tyr Glu Ile Ser Ser Pro Asp
805 810 815

Gly Tyr Ile Glu Val Lys Thr Lys Pro Val Val Thr Phe Thr Ile Gln
820 825 830

Asn Gly Glu Val Thr Asn Leu Lys Ala Asp Pro Asn Ala Asn Lys Asn
835 840 845

Gln Ile Gly Tyr Leu Glu Gly Asn Gly Lys His Leu Ile Thr Asn Thr
850 855 860

Pro Lys Arg Pro Pro Gly Val Phe Pro Lys Thr Gly Gly Ile Gly Thr
865 870 875 880

Ile Val Tyr Ile Leu Val Gly Ser Thr Phe Met Ile Leu Thr Ile Cys
885 890 895

Ser Phe Arg Arg Lys Gln Leu
900

<210> 126
<211> 1251
<212> DNA
<213> Streptococcus agalactiae

<400> 126
atgaatagaa aagttgagga aaaaatggct gggaatcgta ataacgatat gaatgtctat 60
tgttcatttt gtggcaaaag ccaagatgaa gtaaaaaaaa ttattgcagg taatggtgtt 120
ttcatttgta atgaatgtgt ggccttatca caagaaatta ttaaggaaga attagctgag 180
gaagtactgg ctcatttagc agaagtacca aaacctaagg aactattaga aatattaaat 240
caatatgttg tagggcaaga tcgtgctaaa cgtgctttag cagttgctgt ctacaatcat 300
tacaagcgtg ttagttatac cgagagtagt gacgatgatg tagatttgca aaaatccaac 360
attttgatga ttggtccaac tggctcagga aaaaccttct tagcacaaac actggctaaa 420
agccttaatg taccgtttgc tattgcagat gcgacttcat tgaccgaagc aggatacgtt 480
ggagaagatg ttgagaatat tcttcttaaa ttgattcaag ctgctgatta taatgtcgaa 540
cgtgctgagc gtggtattat ctacgttgat gaaatagata aaattgctaa gaaaggcgaa 600
aatgtttcta tcacacgtga tgtgtctggt gaaggtgtac agcaagccct tcttaaaatt 660
attgagggta cggtagcaag tgttccccca cagggtgggc gtaaacatcc taaccaagaa 720
atgattcaaa ttaataccaa gaacatcctt tttattgtcg gtggtgcttt tgatggtatt 780
gaagaccttg tgaagcaacg tttaggcgaa aaagttattg gttttggaca gacaagccgt 840
aaaattgatg acaacgcttc ttatatgcaa gagataattt ctgaggatat tcaaaagttt 900
ggactgattc cagagtttat tggccgttta ccagtagttg cagcgttaga acttcttact 960
gcagaagatc tggttcgtat tctgacagaa ccacgcaatg ctttggttaa acaataccaa 1020
accttattat cttatgatgg tgtagaattg gaatttgacc aggatgctct attggctatc 1080
gctgataagg ctatcgagcg caagactggt gcacgtggtt tacgttctat tattgaagaa 1140
acgatgcttg atatcatgtt tgaaattcca agccaagaag atgtaacaaa agttcgtatc 1200
acaaaggctg ctgttgaggg tactgacaag cctgttttag agacggctta g 1251

<210> 127
<211> 416
<212> PRT
<213> Streptococcus agalactiae

<400> 127

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Met Asn Arg Lys Val Glu Glu Lys Met Ala Gly Asn Arg Asn Asn Asp
  1               5                  10                  15

Met Asn Val Tyr Cys Ser Phe Cys Gly Lys Ser Gln Asp Glu Val Lys
             20                  25                  30

Lys Ile Ile Ala Gly Asn Gly Val Phe Ile Cys Asn Glu Cys Val Ala
         35                  40                  45

Leu Ser Gln Glu Ile Ile Lys Glu Glu Leu Ala Glu Glu Val Leu Ala
     50                  55                  60

His Leu Ala Glu Val Pro Lys Pro Lys Glu Leu Leu Glu Ile Leu Asn
 65                  70                  75                  80

Gln Tyr Val Val Gly Gln Asp Arg Ala Lys Arg Ala Leu Ala Val Ala
                 85                  90                  95

Val Tyr Asn His Tyr Lys Arg Val Ser Tyr Thr Glu Ser Ser Asp Asp
            100                 105                 110

Asp Val Asp Leu Gln Lys Ser Asn Ile Leu Met Ile Gly Pro Thr Gly
        115                 120                 125

Ser Gly Lys Thr Phe Leu Ala Gln Thr Leu Ala Lys Ser Leu Asn Val
    130                 135                 140

Pro Phe Ala Ile Ala Asp Ala Thr Ser Leu Thr Glu Ala Gly Tyr Val
145                 150                 155                 160
```

Gly Glu Asp Val Glu Asn Ile Leu Leu Lys Leu Ile Gln Ala Ala Asp
165 170 175

Tyr Asn Val Glu Arg Ala Glu Arg Gly Ile Ile Tyr Val Asp Glu Ile
180 185 190

Asp Lys Ile Ala Lys Lys Gly Glu Asn Val Ser Ile Thr Arg Asp Val
195 200 205

Ser Gly Glu Gly Val Gln Gln Ala Leu Leu Lys Ile Ile Glu Gly Thr
210 215 220

Val Ala Ser Val Pro Pro Gln Gly Gly Arg Lys His Pro Asn Gln Glu
225 230 235 240

Met Ile Gln Ile Asn Thr Lys Asn Ile Leu Phe Ile Val Gly Gly Ala
245 250 255

Phe Asp Gly Ile Glu Asp Leu Val Lys Gln Arg Leu Gly Glu Lys Val
260 265 270

Ile Gly Phe Gly Gln Thr Ser Arg Lys Ile Asp Asp Asn Ala Ser Tyr
275 280 285

Met Gln Glu Ile Ile Ser Glu Asp Ile Gln Lys Phe Gly Leu Ile Pro
290 295 300

Glu Phe Ile Gly Arg Leu Pro Val Val Ala Ala Leu Glu Leu Leu Thr
305 310 315 320

Ala Glu Asp Leu Val Arg Ile Leu Thr Glu Pro Arg Asn Ala Leu Val
325 330 335

Lys Gln Tyr Gln Thr Leu Leu Ser Tyr Asp Gly Val Glu Leu Glu Phe
340 345 350

Asp Gln Asp Ala Leu Leu Ala Ile Ala Asp Lys Ala Ile Glu Arg Lys
355 360 365

Thr Gly Ala Arg Gly Leu Arg Ser Ile Ile Glu Glu Thr Met Leu Asp
370 375 380

Ile Met Phe Glu Ile Pro Ser Gln Glu Asp Val Thr Lys Val Arg Ile
385 390 395 400

Thr Lys Ala Ala Val Glu Gly Thr Asp Lys Pro Val Leu Glu Thr Ala
405 410 415

<210> 128
<211> 786
<212> DNA
<213> Streptococcus agalactiae

<400> 128
atgaaaagat tacataaact gtttataacc gtaattgcta cattaggtat gttgggggta 60
atgacctttg gtcttccaac gcagccgcaa aacgtaacgc cgatagtaca tgctgatgtc 120
aattcatctg ttgatacgag ccaggaattt caaaataatt taaaaaatgc tattggtaac 180
ctaccatttc aatatgttaa tggtatttat gaattaaata ataatcagac aaatttaaat 240
gctgatgtca atgttaaagc gtatgttcaa aatacaattg acaatcaaca aagactatca 300
actgctaatg caatgcttga tagaaccatt cgtcaatatc aaaatcgcag agataccact 360
cttcccgatg caaattggaa accattaggt tggcatcaag tagctactaa tgaccattat 420
gggcatgcag tcgacaaggg gcatttaatt gcctatgctt tagctggaaa tttcaaaggt 480
tgggatgctt ccgtgtcaaa tcctcaaaat gttgtcacac aaacagctca ttccaaccaa 540
tcaaatcaaa aaatcaatcg tggacaaaat tattatgaaa gcttagttcg taaggcggtt 600
gaccaaaaca aacgtgttcg ttaccgtgta actccattgt accgtaatga tactgattta 660
gttccatttg caatgcacct agaagctaaa tcacaagatg gcacattaga atttaatgtt 720
gctattccaa acacacaagc atcatacact atggattatg caacaggaga aataacacta 780
aattaa 786

<210> 129
<211> 261
<212> PRT
<213> Streptococcus agalactiae

<400> 129

```
Met Lys Arg Leu His Lys Leu Phe Ile Thr Val Ile Ala Thr Leu Gly
  1               5                  10                  15

Met Leu Gly Val Met Thr Phe Gly Leu Pro Thr Gln Pro Gln Asn Val
            20                  25                  30

Thr Pro Ile Val His Ala Asp Val Asn Ser Ser Val Asp Thr Ser Gln
        35                  40                  45

Glu Phe Gln Asn Asn Leu Lys Asn Ala Ile Gly Asn Leu Pro Phe Gln
    50                  55                  60

Tyr Val Asn Gly Ile Tyr Glu Leu Asn Asn Asn Gln Thr Asn Leu Asn
65                  70                  75                  80

Ala Asp Val Asn Val Lys Ala Tyr Val Gln Asn Thr Ile Asp Asn Gln
                85                  90                  95

Gln Arg Leu Ser Thr Ala Asn Ala Met Leu Asp Arg Thr Ile Arg Gln
            100                 105                 110

Tyr Gln Asn Arg Arg Asp Thr Thr Leu Pro Asp Ala Asn Trp Lys Pro
        115                 120                 125

Leu Gly Trp His Gln Val Ala Thr Asn Asp His Tyr Gly His Ala Val
    130                 135                 140

Asp Lys Gly His Leu Ile Ala Tyr Ala Leu Ala Gly Asn Phe Lys Gly
145                 150                 155                 160

Trp Asp Ala Ser Val Ser Asn Pro Gln Asn Val Val Thr Gln Thr Ala
                165                 170                 175
```

His Ser Asn Gln Ser Asn Gln Lys Ile Asn Arg Gly Gln Asn Tyr Tyr
180 185 190

Glu Ser Leu Val Arg Lys Ala Val Asp Gln Asn Lys Arg Val Arg Tyr
195 200 205

Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala
210 215 220

Met His Leu Glu Ala Lys Ser Gln Asp Gly Thr Leu Glu Phe Asn Val
225 230 235 240

Ala Ile Pro Asn Thr Gln Ala Ser Tyr Thr Met Asp Tyr Ala Thr Gly
245 250 255

Glu Ile Thr Leu Asn
260

<210> 130
<211> 621
<212> DNA
<213> Streptococcus agalactiae

<400> 130
atgaaaaact atcgaaaact tattgtacta ctacttctaa tctttttgc catttttatg 60
ggagcatatg cttacacgca tattgttgaa aaaagatccc taactagcaa tactattgaa 120
aaaactctac ctgtggtaaa tcagattaag cctcaaacca ttaaagaata ccaaaattac 180
ttaactaagg tagctaaacg taatgttctt cctgtagaca ttcctcaggc attaaataat 240
gaaaaggtag aaattactgc tactgatggc atgcaaacat tcacttggaa tgataaaaat 300
aatcctaagc aaaaggttat cttctatgtt catggaggat catatatcca tcaagcttcc 360
gaattacaat atatttttgt caataaacta gctaaaaaat tagatgcaaa agttgtcttt 420
cctatttacc ctaaagctcc tacatataat tatagtgatg ctatccccaa aattaaaaaa 480
ttataccaaa atacattagc tagcgtcaca tctcacaaac agattatcct agtaggtgaa 540
agtgcaggcg gaggccttgc tttaggtatt gctgataacc ttgcacggag catatcaaac 600
aaccaaaaga aattatttta a 621

<210> 131
<211> 206
<212> PRT
<213> Streptococcus agalactiae

<400> 131

```
Met Lys Asn Tyr Arg Lys Leu Ile Val Leu Leu Leu Leu Ile Phe Phe
 1               5                  10                  15

Ala Ile Phe Met Gly Ala Tyr Ala Tyr Thr His Ile Val Glu Lys Arg
            20                  25                  30

Ser Leu Thr Ser Asn Thr Ile Glu Lys Thr Leu Pro Val Val Asn Gln
        35                  40                  45

Ile Lys Pro Gln Thr Ile Lys Glu Tyr Gln Asn Tyr Leu Thr Lys Val
    50                  55                  60

Ala Lys Arg Asn Val Leu Pro Val Asp Ile Pro Gln Ala Leu Asn Asn
65                  70                  75                  80

Glu Lys Val Glu Ile Thr Ala Thr Asp Gly Met Gln Thr Phe Thr Trp
                85                  90                  95

Asn Asp Lys Asn Asn Pro Lys Gln Lys Val Ile Phe Tyr Val His Gly
            100                 105                 110

Gly Ser Tyr Ile His Gln Ala Ser Glu Leu Gln Tyr Ile Phe Val Asn
        115                 120                 125

Lys Leu Ala Lys Lys Leu Asp Ala Lys Val Val Phe Pro Ile Tyr Pro
    130                 135                 140

Lys Ala Pro Thr Tyr Asn Tyr Ser Asp Ala Ile Pro Lys Ile Lys Lys
145                 150                 155                 160

Leu Tyr Gln Asn Thr Leu Ala Ser Val Thr Ser His Lys Gln Ile Ile
                165                 170                 175
```

Leu Val Gly Glu Ser Ala Gly Gly Gly Leu Ala Leu Gly Ile Ala Asp
180 185 190

Asn Leu Ala Arg Ser Ile Ser Asn Asn Gln Lys Lys Leu Phe
195 200 205

<210> 132
<211> 885
<212> DNA
<213> Streptococcus agalactiae

<400> 132
ttgattctaa taacttccta tgggataata tctttatcac aaaaattgag ggaatttatt 60
atgaagttaa aacatattgt cttaggatta gccttaacaa cacttttagg agtcacattt 120
agtaatcaag aagtttcagc aagctcaact tcaagtaaag ttgttaaagt tggtgttatg 180
acctttttctg acactgaaaa agcacgttgg gataaaattg aaaagctagt aggtgataaa 240
gctaaaatca aatttacaga atttacagat tatacacaac caaatcaagc gacagccaat 300
aaggatgtgg atattaatgc ctttcaacat tacaatttct tagaaaactg gaataaggaa 360
aataagaaaa acttaattcc acttgaaaag acttacttag ctccaattcg tatctattct 420
gagaaggtaa aatctcttaa aaaattgaaa aaaggagcca ctattgcaat tccaaatgat 480
gcaacaaatg gtagccgtgc attgtatgtc cttcagtcag caggtttaat caaattgaat 540
gtttctggta agaaggttgc aacagttgct aatatcacat ctaataaaaa ggatattaat 600
attcaggagt tagatgcgag tcaaacacca cgtgcactca aagatgtaga tgcagctatt 660
attaataata catacattga gcaagctaat ttaaaacctt cagatgctat ctttgttgag 720
aaatcagata aaaattcaaa acaatggatt aatatcattg cgggacgtaa aaattggaaa 780
aagcaaaaga acgctaaagc tatccaagct atcttggatg cttatcacac agatgaagtg 840
aaaaaagtta tcaaagatac ttcagctgat attccacaat ggtaa 885

<210> 133
<211> 294
<212> PRT
<213> Streptococcus agalactiae

<400> 133
Met Ile Leu Ile Thr Ser Tyr Gly Ile Ile Ser Leu Ser Gln Lys Leu
1 5 10 15

Arg Glu Phe Ile Met Lys Leu Lys His Ile Val Leu Gly Leu Ala Leu
20 25 30

Thr Thr Leu Leu Gly Val Thr Phe Ser Asn Gln Glu Val Ser Ala Ser
35 40 45

Ser Thr Ser Ser Lys Val Val Lys Val Gly Val Met Thr Phe Ser Asp
50 55 60

Thr Glu Lys Ala Arg Trp Asp Lys Ile Glu Lys Leu Val Gly Asp Lys
65 70 75 80

Ala Lys Ile Lys Phe Thr Glu Phe Thr Asp Tyr Thr Gln Pro Asn Gln
85 90 95

Ala Thr Ala Asn Lys Asp Val Asp Ile Asn Ala Phe Gln His Tyr Asn
100 105 110

Phe Leu Glu Asn Trp Asn Lys Glu Asn Lys Lys Asn Leu Ile Pro Leu
115 120 125

Glu Lys Thr Tyr Leu Ala Pro Ile Arg Ile Tyr Ser Glu Lys Val Lys
130 135 140

Ser Leu Lys Lys Leu Lys Lys Gly Ala Thr Ile Ala Ile Pro Asn Asp
145 150 155 160

Ala Thr Asn Gly Ser Arg Ala Leu Tyr Val Leu Gln Ser Ala Gly Leu
165 170 175

Ile Lys Leu Asn Val Ser Gly Lys Lys Val Ala Thr Val Ala Asn Ile
180 185 190

Thr Ser Asn Lys Lys Asp Ile Asn Ile Gln Glu Leu Asp Ala Ser Gln
195 200 205

Thr Pro Arg Ala Leu Lys Asp Val Asp Ala Ala Ile Ile Asn Asn Thr
210 215 220

Tyr Ile Glu Gln Ala Asn Leu Lys Pro Ser Asp Ala Ile Phe Val Glu
225 230 235 240

Lys Ser Asp Lys Asn Ser Lys Gln Trp Ile Asn Ile Ile Ala Gly Arg
245 250 255

Lys Asn Trp Lys Lys Gln Lys Asn Ala Lys Ala Ile Gln Ala Ile Leu
260 265 270

Asp Ala Tyr His Thr Asp Glu Val Lys Lys Val Ile Lys Asp Thr Ser
275 280 285

Ala Asp Ile Pro Gln Trp
290

<210> 134
<211> 1350
<212> DNA
<213> Streptococcus agalactiae

<400> 134
atgtcaaatc aatatgatta tatcgttatt ggtggaggta gtgcaggcag tggtaccgct 60
aatagggcag ccatgtatgg agcaaaagtc ctgttaattg aaggtggaca agtaggtgga 120
acttgtgtta acttaggttg tgtacctaag aaaatcatgt ggtatggtgc acaagtttct 180
gagacactcc ataagtatag ttcaggttat ggttttgaag ccaataatct tagttttgat 240
tttactactc taaaagctaa tcgcgatgct tacgtgcagc ggtctagaca gtcgtatgcc 300
gctaattttg agcgtaatgg ggtcgaaaag attgatggat ttgctcgttt tattgataac 360
catactattg aagtgaatgg tcagcaatat aaagctcctc acattactat tgcaacaggt 420
ggacaccctc tttaccctga tattattgga agtgaacttg gtgagacttc tgatgatttt 480
tttggatggg agaccttacc aaattctata ttgattgttg gggcgggcta tatcgcggca 540
gaacttgctg gagtggttaa tgaattaggc gttgaaaccc atcttgcatt tagaaaagac 600
catattctac gcggatttga tgacatggta acaagtgagg ttatggctga aatggagaaa 660
tcaggtatct ctttacatgc taaccatgta cctaaatctc ttaaacgcga tgaaggtggc 720
aagttgattt ttgaagctga aaatgggaaa acgcttgtcg ttgatcgtgt aatatgggct 780
atcggccgtg gaccaaatgt agacatggga cttgaaaata ccgatattgt tttaaatgat 840
aaagattata tcaaaacaga tgaatttgag aatacttctg tagatggcgt gtatgctatt 900

ggagatgtta atgggaaaat tgccttgaca ccggtagcaa ttgcagcagg tcgtcgctta 960
tcagaaagac tttttaatca taaagataac gaaaaattag attaccataa tgtaccttca 1020
gttatttttа ctcaccctgt aattgggacg gtaggacttt cagaagcagc agctatcgag 1080
caatttggaa aagataatat caaagtctat acatcaactt ttacctctat gtatacggct 1140
gttaccagta atcgccaagc agttaagatg aagctcataa ccctaggaaa agaggaaaaa 1200
gttattgggc ttcatggtgt tggttatggt attgatgaaa tgattcaagg tttttcagtt 1260
gctatcaaaa tgggggctac taaagcagac tttgatgata ctgttgctat tcacccaact 1320
ggatctgagg aatttgttac aatgcgctaa 1350

<210> 135
<211> 449
<212> PRT
<213> Streptococcus agalactiae

<400> 135

Met Ser Asn Gln Tyr Asp Tyr Ile Val Ile Gly Gly Gly Ser Ala Gly
1 5 10 15

Ser Gly Thr Ala Asn Arg Ala Ala Met Tyr Gly Ala Lys Val Leu Leu
20 25 30

Ile Glu Gly Gly Gln Val Gly Gly Thr Cys Val Asn Leu Gly Cys Val
35 40 45

Pro Lys Lys Ile Met Trp Tyr Gly Ala Gln Val Ser Glu Thr Leu His
50 55 60

Lys Tyr Ser Ser Gly Tyr Gly Phe Glu Ala Asn Asn Leu Ser Phe Asp
65 70 75 80

Phe Thr Thr Leu Lys Ala Asn Arg Asp Ala Tyr Val Gln Arg Ser Arg
85 90 95

Gln Ser Tyr Ala Ala Asn Phe Glu Arg Asn Gly Val Glu Lys Ile Asp
100 105 110

Gly Phe Ala Arg Phe Ile Asp Asn His Thr Ile Glu Val Asn Gly Gln
115 120 125

```
Gln Tyr Lys Ala Pro His Ile Thr Ile Ala Thr Gly Gly His Pro Leu
    130                 135                 140

Tyr Pro Asp Ile Ile Gly Ser Glu Leu Gly Glu Thr Ser Asp Asp Phe
145                 150                 155                 160

Phe Gly Trp Glu Thr Leu Pro Asn Ser Ile Leu Ile Val Gly Ala Gly
                165                 170                 175

Tyr Ile Ala Ala Glu Leu Ala Gly Val Val Asn Glu Leu Gly Val Glu
            180                 185                 190

Thr His Leu Ala Phe Arg Lys Asp His Ile Leu Arg Gly Phe Asp Asp
        195                 200                 205

Met Val Thr Ser Glu Val Met Ala Glu Met Glu Lys Ser Gly Ile Ser
    210                 215                 220

Leu His Ala Asn His Val Pro Lys Ser Leu Lys Arg Asp Glu Gly Gly
225                 230                 235                 240

Lys Leu Ile Phe Glu Ala Glu Asn Gly Lys Thr Leu Val Val Asp Arg
                245                 250                 255

Val Ile Trp Ala Ile Gly Arg Gly Pro Asn Val Asp Met Gly Leu Glu
            260                 265                 270

Asn Thr Asp Ile Val Leu Asn Asp Lys Asp Tyr Ile Lys Thr Asp Glu
        275                 280                 285

Phe Glu Asn Thr Ser Val Asp Gly Val Tyr Ala Ile Gly Asp Val Asn
    290                 295                 300

Gly Lys Ile Ala Leu Thr Pro Val Ala Ile Ala Ala Gly Arg Arg Leu
305                 310                 315                 320

Ser Glu Arg Leu Phe Asn His Lys Asp Asn Glu Lys Leu Asp Tyr His
                325                 330                 335
```

Asn Val Pro Ser Val Ile Phe Thr His Pro Val Ile Gly Thr Val Gly
340 345 350

Leu Ser Glu Ala Ala Ala Ile Glu Gln Phe Gly Lys Asp Asn Ile Lys
355 360 365

Val Tyr Thr Ser Thr Phe Thr Ser Met Tyr Thr Ala Val Thr Ser Asn
370 375 380

Arg Gln Ala Val Lys Met Lys Leu Ile Thr Leu Gly Lys Glu Glu Lys
385 390 395 400

Val Ile Gly Leu His Gly Val Gly Tyr Gly Ile Asp Glu Met Ile Gln
405 410 415

Gly Phe Ser Val Ala Ile Lys Met Gly Ala Thr Lys Ala Asp Phe Asp
420 425 430

Asp Thr Val Ala Ile His Pro Thr Gly Ser Glu Glu Phe Val Thr Met
435 440 445

Arg

<210> 136
<211> 1317
<212> DNA
<213> Streptococcus agalactiae

<400> 136
atgagtatca aaaaaagtgt gattggtttt tgcctcgaag ctgcagcatt atcaatgttt 60
gcttgtgtag acagtagtca atctgttatg gctgccgaga aggataaagt cgaaattacg 120
tggtgggctt ttccaacctt tactcaagaa aaggctaagg atggagtagg tacttatgag 180
aaaaaagtca tcaaggcttt tgaaaagaaa aatcctaata taaaagtaaa actagagaca 240
attgatttca catctggacc tgaaaaaatc actacagcaa ttgaagcagg gacagcacct 300
gatgtgcttt ttgatgcacc agggcgaatt attcaatatg gtaaaaatgg taaattagca 360

gatttgaatg atttatttac agaccaattt attaaggatg tcaataataa gaacatcatt 420
caagcttcta agtctggcga taaagcctac atgtatccaa taagttctgc cccattttat 480
atggcgttca ataaaaaaat gcttaaagat gcaggagttt tgaaacttgt aaaagaaggt 540
tggactacta gtgattttga aaaagtacta aaagcactaa aaaataaagg ctatacacca 600
ggttcattct ttgcaaacgg gcaaggagga gatcaaggac cacgtgcatt ttttgctaat 660
ctttatagtg ctccaataac agataaagaa gtaacaaaat ataccactga cactaaaaat 720
tctgtaaaat caatgaaaaa aatagttgaa tggattaaga aaggctactt gatgaatggg 780
tctcagtatg atggctcagc tgacattcaa aacttcgcca atggacaaac tgctttcact 840
atcctatggg ctccagctca accaaaaact caagcaaaat tattagagtc aagtaaagtg 900
gattaccttg aagtgccatt cccatcagaa gatggaaaac cagatttaga ataccttgtt 960
aatggttttg cggtctttaa taataaagat gaaaacaaag taaaagcctc taagaaattt 1020
atcacttttа ttgctgatga taaaaaatgg ggaccaaaag atgttatacg tacaggtgct 1080
ttcccagtta gaacatcatt tggggatctt tataaaggtg ataaacgtat gatgaagatt 1140
tcaaaatgga ctcaatatta ttcaccatat tacaacacta tcgatggatt ttctgaaatg 1200
agaaccttat ggttcccaat ggttcaatct gtatccaatg gtgatgaaaa accagcagat 1260
gctttgaaag actttactca aaaagcaaat gataccatta aaaaagcagc taaataa 1317

<210> 137
<211> 438
<212> PRT
<213> Streptococcus agalactiae

<400> 137
Met Ser Ile Lys Lys Ser Val Ile Gly Phe Cys Leu Glu Ala Ala Ala
1 5 10 15

Leu Ser Met Phe Ala Cys Val Asp Ser Ser Gln Ser Val Met Ala Ala
20 25 30

Glu Lys Asp Lys Val Glu Ile Thr Trp Trp Ala Phe Pro Thr Phe Thr
35 40 45

Gln Glu Lys Ala Lys Asp Gly Val Gly Thr Tyr Glu Lys Lys Val Ile
50 55 60

Lys Ala Phe Glu Lys Lys Asn Pro Asn Ile Lys Val Lys Leu Glu Thr
65 70 75 80

150

Ile Asp Phe Thr Ser Gly Pro Glu Lys Ile Thr Thr Ala Ile Glu Ala
85 90 95

Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly Arg Ile Ile Gln
100 105 110

Tyr Gly Lys Asn Gly Lys Leu Ala Asp Leu Asn Asp Leu Phe Thr Asp
115 120 125

Gln Phe Ile Lys Asp Val Asn Asn Lys Asn Ile Ile Gln Ala Ser Lys
130 135 140

Ser Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser Ala Pro Phe Tyr
145 150 155 160

Met Ala Phe Asn Lys Lys Met Leu Lys Asp Ala Gly Val Leu Lys Leu
165 170 175

Val Lys Glu Gly Trp Thr Thr Ser Asp Phe Glu Lys Val Leu Lys Ala
180 185 190

Leu Lys Asn Lys Gly Tyr Thr Pro Gly Ser Phe Phe Ala Asn Gly Gln
195 200 205

Gly Gly Asp Gln Gly Pro Arg Ala Phe Phe Ala Asn Leu Tyr Ser Ala
210 215 220

Pro Ile Thr Asp Lys Glu Val Thr Lys Tyr Thr Thr Asp Thr Lys Asn
225 230 235 240

Ser Val Lys Ser Met Lys Lys Ile Val Glu Trp Ile Lys Lys Gly Tyr
245 250 255

Leu Met Asn Gly Ser Gln Tyr Asp Gly Ser Ala Asp Ile Gln Asn Phe
260 265 270

Ala Asn Gly Gln Thr Ala Phe Thr Ile Leu Trp Ala Pro Ala Gln Pro
275 280 285

Lys Thr Gln Ala Lys Leu Leu Glu Ser Ser Lys Val Asp Tyr Leu Glu
290 295 300

Val Pro Phe Pro Ser Glu Asp Gly Lys Pro Asp Leu Glu Tyr Leu Val
305 310 315 320

Asn Gly Phe Ala Val Phe Asn Asn Lys Asp Glu Asn Lys Val Lys Ala
325 330 335

Ser Lys Lys Phe Ile Thr Phe Ile Ala Asp Asp Lys Lys Trp Gly Pro
340 345 350

Lys Asp Val Ile Arg Thr Gly Ala Phe Pro Val Arg Thr Ser Phe Gly
355 360 365

Asp Leu Tyr Lys Gly Asp Lys Arg Met Met Lys Ile Ser Lys Trp Thr
370 375 380

Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe Ser Glu Met
385 390 395 400

Arg Thr Leu Trp Phe Pro Met Val Gln Ser Val Ser Asn Gly Asp Glu
405 410 415

Lys Pro Ala Asp Ala Leu Lys Asp Phe Thr Gln Lys Ala Asn Asp Thr
420 425 430

Ile Lys Lys Ala Ala Lys
435

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<211> 40
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<220>
<223> Description of Artificial Sequence: Primer

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cgagatctga tatctcacaa acagataacg gcgtaaatag 40

<210> 139
<211> 43
<212> DNA
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<220>
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gaagatcttc cccgggatca caaacagata acggcgtaaa tag 43

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<211> 42
<212> DNA
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<223> Description of Artificial Sequence: Primer

<400> 140
cgagatctga tatccatcac aaacagataa cggcgtaaat ag 42

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<211> 32
<212> DNA
<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

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cgggatcctt atggacctga atcagcgttg tc 32

<210> 142
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<212> DNA
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<223> Description of Artificial Sequence: Primer

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ggatgctttg tttcaggtgt atc 23

<210> 143
<211> 82
<212> DNA
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catgatatcg gtacctcaag ctcatatcat tgtccggcaa tggtgtgggc ttttttgtt 60
ttagcggata acaatttcac ac 82

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<211> 81
<212> DNA
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<223> Description of Artificial Sequence: Primer

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gcggatcccc cgggcttaat taatgtttaa acactagtcg aagatctcgc gaattctcct 60
gtgtgaaatt gttatccgct a 81

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<211> 24
<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 145
cgccagggtt ttcccagtca cgac 24

<210> 146
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<220>
<223> Description of Artificial Sequence: Primer

<400> 146
tcaggggggc ggagcctatg 20

<210> 147
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<400> 147
tcgtatgttg tgtggaattg tg 22

<210> 148
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<400> 148
tccggctcgt atgttgtgtg gaattg 26

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aagtatcaga tctgatatct cacaaacaga taacggcgta aat 43

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aagtatcaga tcttccccgg gatcacaaac agataacggc gtaaat 46

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<211> 45
<212> DNA
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aagtatcaga tctgatatcc atcacaaaca gataacggcg taaat 45

<210> 152
<211> 24
<212> DNA
<213> Staphylococcus aureus

<400> 152
tcacaaacag ataacggcgt aaat 24

<210> 153
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<212> DNA
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<223> Description of Artificial Sequence: Primer

<400> 153
cgggatccgc caccatgacc acttctcaag ctgttttagc 40

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<223> Description of Artificial Sequence: Primer

<400> 154
ttgcggccgc acgattatca acaaagttct g 31

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cggatccgcc accatggcta ctcatattgg aagttaccag c 41

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ttgcggccgc agggtttatt tgttgaagtg tcttg 35

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<223> Description of Artificial Sequence: Primer

<400> 157
cggatccgcc accatgtatc tatatcattt accaatgccc 40

<210> 158
<211> 34
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<223> Description of Artificial Sequence: Primer

<400> 158
ttgcggccgc tttatgtata gaaacagcag tccc 34

<210> 159
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<220>
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<400> 161
cggatccgcc accatgattg ttggacacgg aattg 35

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<400> 163
cggatccgcc accatggcga ctaaagagtt aggtgttag 39

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ttgcggccgc tatagtttta gtttcaactt gtctagatg 39

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cgggatccac catgtatacg agtttacaac caaatcatg 39

<210> 166
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<400> 166
ttgcggccgc gtcagctcgt actgtttttt tagc 34

<210> 167
<211> 42
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cggatccgcc accatgtgtc aaatgaatag tgaacataaa ag 42

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<400> 168
ttgcggccgc ctcaaataat ttacctccaa ttcg 34

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<223> Description of Artificial Sequence: Primer

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ttgcggccgc tgatttacca gtttggaaga gttc 34

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<211> 44
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<223> Description of Artificial Sequence: Primer

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<223> Description of Artificial Sequence: Primer

<400> 172
ttgcggccgc ttctttgttc caactttctg g 31

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<223> Description of Artificial Sequence: Primer

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cggatccgcc accatgatag agtggattca aacacattta c 41

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ttgcggccgc tttatgactc aagcgacgtg tta 33

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ttgcggccgc cttgtcatat tcatctccct tcaac 35

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<210> 180
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<212> DNA
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<210> 181
<211> 42
<212> DNA
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ttgcggccgc aacacctggt gggcgtttgg 30

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<223> Description of Artificial Sequence: Primer

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cggatccgcc accatggctg ggaatcgtaa taacg 35

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<223> Description of Artificial Sequence: Primer

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ttgcggccgc agccgtctct aaaacaggct tg 32

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<223> Description of Artificial Sequence: Primer

<400> 185
cggatccgcc accatgcttc caacgcagcc gcaaaac 37

<210> 186
<211> 41
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ttgcggccgc atttagtgtt atttctcctg ttgcataatc c 41

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cgggatccac catgtacacg catattgttg aaaaaag 37

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ttgcggccgc aaataatttc ttttggttgt ttg 33

<210> 189
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<400> 193
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<223> Description of Artificial Sequence: Primer

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ttgcggccgc attatttagc tgctttttta atgg 34

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<223> Description of Artificial Sequence: Primer

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<220>
<223> Description of Artificial Sequence: Primer

<400> 199
cgggatccgc caccatg 17

<210> 200
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<220>
<223> Description of Artificial Sequence: Primer

<400> 200
ttgcggccgc 10

<210> 201
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<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 201
atggaaaaaa atacttggaa aaaattac 28

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<212> DNA
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ctattttgtt ttagcgatgt ctttatc 27

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<400> 203
atgtcaaaac aaaaagtaac ggcaac 26

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<400> 207
ttgttcaatt ttataggttt tagaacttgg 30

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<400> 208
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<220>
<223> Description of Artificial Sequence: Primer

<400> 209
atgacaaaaa aacttattat tgctatatta g 31

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atgatacgcc agtttttaag agaa 24

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ttatttatgt atagaaacag cagtccc 27